CSO'S BOLD CALL FOR 'SPACE CONTROL' 23

DID THE SEALS FORGET CHAPMAN—AGAIN? 32

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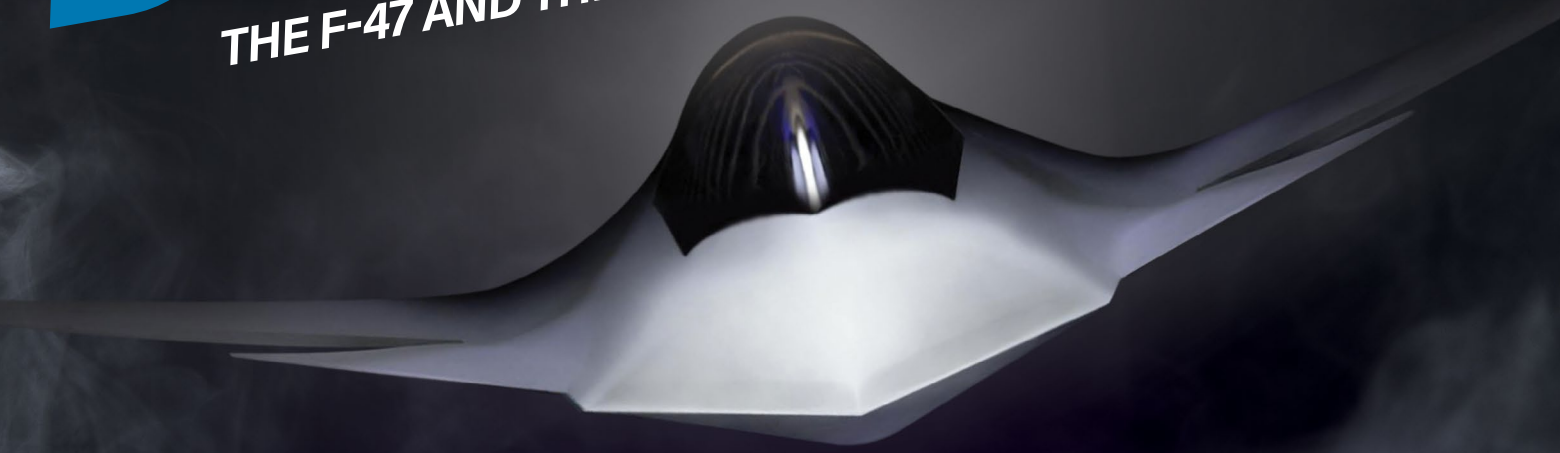
airandspaceforces.com

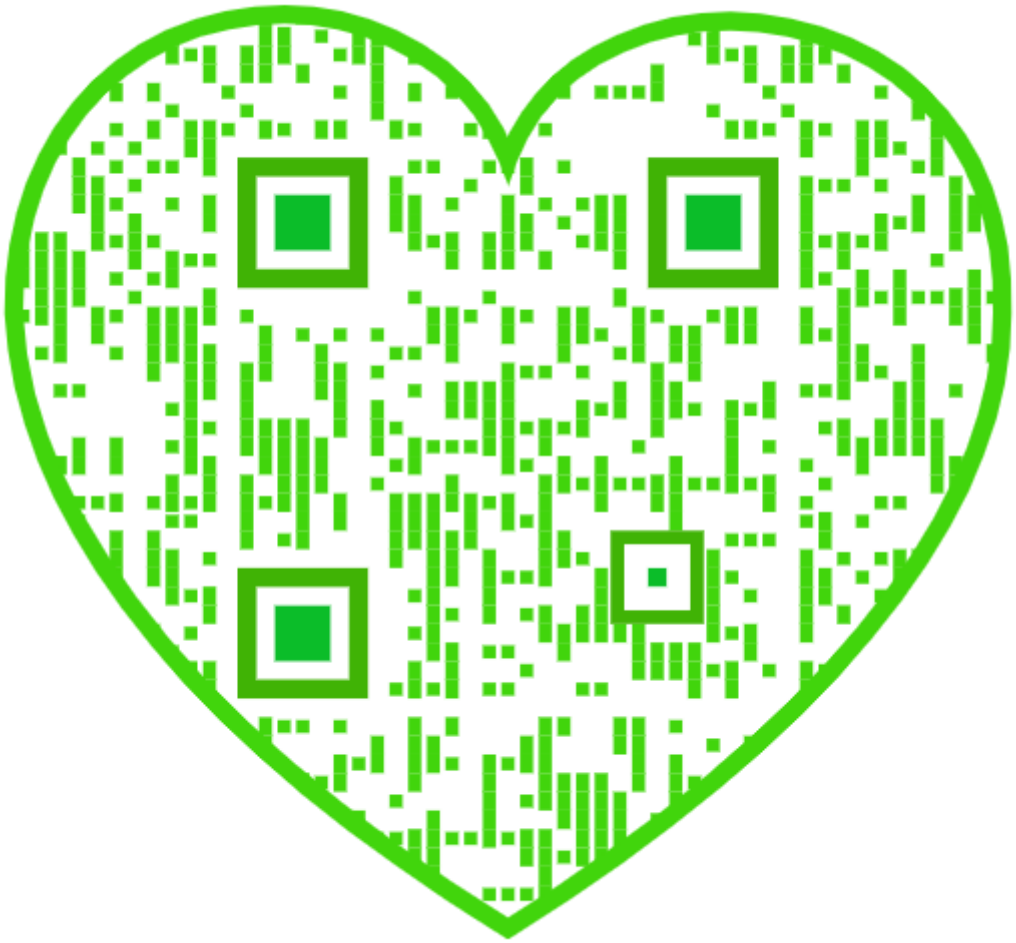
AIR DOMINANCE

THE F-47 AND THE CASE FOR 'MORE AIR FORCE' 18



Golden Dome | 25
Pilot Shortage | 48
Save the BONE | 38
Training New Pilots | 06

Published by the Air & Space Forces Association



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March/April 2025, Vol. 108, Nos. 3&4 airandspaceforces.com

USAF

DEPARTMENTS

2 Editorial: Air and Space Dominance
By Tobias Naegele

3 Letters

6 Strategy & Policy: Hybrid Approach to Undergraduate Pilot Training

8 Airframes

16 Verbatim

17 Faces of the Force

18 World: USAF's F-47 Next-Generation Fighter; More Airpower Needed; Focusing on Space Superiority; Golden Dome; and more.

54 AFA in Action: Meet AFA's new Executive VP Maj. Gen. Larry Stutzriem, USAF (Ret.); ENGAGE@AFA MilSpouse Summit

56 Heroes/Leaders: Benjamin O. Davis Jr.

FEATURES

32 Battle of Takur Ghar Controversy Continues
By Sean Naylor

New Medal of Honor Museum plays down 21st century Air Force hero.

38 Risking America's Long-Range Strike Capability
By Ross Hobbs

Why retiring the B-1 too soon could undermine U.S. security.

43 AWACS Enters the Homestretch
By Greg Hadley

As USAF awaits the E-7, Airmen keep the E-3 flying.

48 Fixing the Air Force Pilot Crisis
By Heather Penney

Combat airpower requires more planes and more pilots to fly them.

Air Force Tech. Sgt. John Chapman was posthumously awarded the Medal of Honor and promoted to master sergeant. See "Battle of Takur Ghar Controversy Continues," p. 32.

ON THE COVER

USAF; Eric Lee/staff

An artist's rendering of the Next Generation Air Dominance (NGAD) manned fighter designed by Boeing. The rendering highlights the Air Force's sixth-generation fighter, the F-47.

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EDITORIAL

By Tobias Naegele

Air and Space Dominance

The Trump administration arrived in Washington promising to restore America's military, reinvigorate deterrence, and bring back its warrior ethos. These are not things that can change overnight, but there is evidence of progress.

Topics that were gingerly avoided six months ago like the Next-Generation Air Dominance fighter or offensive space weapons, are now emerging into the open. Air Force Chief of Staff Gen. David Allvin is ramping up his campaign for "more Air Force" in bolder and more colorful terms. At any moment, he said at the AFA Warfare Symposium in March, the Air Force must be able "to put a warhead on a forehead anywhere the President might want."

That kind of talk resonates with many, including President Donald Trump, who held a White House news conference in March to announce America's first new fighter plane in 24 years.

The last time a new Air Force fighter was announced—the F-35, in 2001—those honors were delegated to the Secretary of the Air Force. This time it was an Oval Office event featuring the President, Secretary of Defense, and Air Force Chief of Staff, who stood beside a rendering of Boeing's F-47, which aims to be the fastest, stealthiest, most reliable modern fighter on Earth.

Just weeks earlier, Allvin gave fighter designations—for the first time ever—to a pair of low-observable drones. The General Atomics YFQ-42 and Anduril YFQ-44 are autonomous Collaborative Combat Aircraft that will operate as armed wingman, extensions of the combat power of the F-35 and F-47. The fighter designation might be a stretch, but it represents revolutionary thinking and military ambition, even swagger.

Revolutionary thinking and a newfound military swagger.

Space superiority, meanwhile, is having its own moment. Chief of Space Operations Gen. B. Chance Saltzman turned up the volume on Guardians as warfighters and space as a warfighting domain from the moment he became Chief in 2023. Yet he has carefully stewarded his messaging, navigating both restrictive classification rules and the do-no-harm sensibilities that space operators have long held as sacrosanct.

It's not that the United States could not shoot down a satellite—the Air Force demonstrated the feat with a missile fired from an F-15 in 1985, and in 2008's Operation Burnt Frost, a Navy Aegis missile cruiser shot down a failed satellite from the Pacific Ocean. But being able to do such things did not mean we would.

At the AFA Warfare Symposium in March, however, Saltzman declared "space control" the newest "core function of the Space Force" and his "number one priority." Said Saltzman: "Domain control is the special province of warfighters, a unique responsibility that only military services hold." It comprises the mission areas required to contest and control the domain, including kinetic means, to disrupt, degrade, and even destroy enemy satellites.

"Historically, we've avoided talking too much about space control," Saltzman said. "But why would you have a military space service if not to execute space control?"

China and Russia have demonstrated anti-satellite missiles, orbiting grappling arms, and threatening maneuvers in space for years, and the U.S. hurled back words: "irresponsible" and "dangerous." Counterspace operations evoked shadowboxing and cat-and-mouse maneuver, not explosive force. Saltzman has opened that aperture and is selling the concept to his own Guardians, as well as the public.

Troy Meink, President Trump's nominee for Air Force Secretary, channeled the CSO at his late-March confirmation hearing. Meink spent the bulk of his professional career in space intelligence, most recently as principal deputy director of the National Reconnaissance Organization. That makes him something of an enigma; a political appointee whose public profile is essentially blank.

"Space control and counterspace systems are critical," Meink told the committee, explaining the Space Force's most critical needs. "That is probably the area we are being most stressed in from a threat perspective." In written testimony, he said, "The Space Force must prioritize space domain awareness, resilience, and capabilities that 'hold at risk' adversary space assets to protect the Joint Force."

At the Warfare Symposium, Air Combat Command's Gen. Kenneth Wilsbach made clear space is not just for space people. "We should start talking about air superiority together with space superiority as a combo," he said. "You're likely not going to be able to achieve air superiority in the modern sense without space superiority as well."

Saltzman, in a visit to AFA's Mitchell Institute for Aerospace Studies, mused that the line between air and space—what some have called "near space"—could also be called "far air." He expressed pride at the ability of the two services to cover the seams between the domains together.

Everything now depends on space for navigation, communications, targeting, and more, Wilsbach said. "If you don't have air and space superiority, you'll … have a very difficult time achieving any of those other objectives."

Some Air Force leaders have posited that air superiority must be achieved in new ways in the modern age, given increasingly lethal enemy defenses. Air forces have always faced this challenge. The U.S. Army Air Forces could not achieve air superiority in the early days of World War II, and American forces paid a devastating price. By the end of the war, however, USAAF had surpassed air superiority and attained air supremacy, as it did in Operation Desert Storm nearly 50 years later. In that war, the U.S. Air Force was so dominant the Iraqi air force fled the battlespace, incapacitated.

"There's been some talk in the public that the age of air superiority is over," Wilsbach said. "I categorically reject that."

The Air Force has always been subject to competing intellectual visions, those who believe wars can be won in the air and those who view airpower as a supporting element to surface operations. While these need not be mutually exclusive, the question is often oversimplified. The Army's 1980s-era Air-Land Battle doctrine subordinated airpower; Desert Storm reversed that concept, demonstrating that airpower as the primary force could be a more decisive means of military engagement; and Operation Allied Force to end Serbia's unjust war on Kosovo was a rare demonstration that airpower alone can be decisive.

American leaders over the past quarter-century misread or ignored those lessons and bungled extended military entanglements in Afghanistan and Iraq. In Syria, where airpower all along was the primary element of force application, it was only late in the fight that intense airpower was applied for strategic, not just tactical effects.

Yet, despite our nation's reliance on air- and spacepower, we put off modernizing those forces. Like a homeowner juggling bills and hoping to get one more winter out of his furnace, we paid the short-term bill for counterinsurgencies and ignored the investment necessary to update our combat air forces. Now those bills are now due.

The new administration is saying the right things. But words alone will not buy air and space superiority. That will take money. And the only real measure of a government's commitment to something is the amount of resources it's willing to commit. Stand by for the incoming 2026 budget request.

LETTERS

Danger, Will Robinson

Reference "Verbatim: The Bots in Control" [January/February 2025], it does not appear to me that any combatant commander nor a commander in chief could allow artificial intelligence to make any final decision to launch either conventional or nuclear weapons against a known enemy.

However, targeting staffs could develop target lists and attack matrices that would facilitate the use of AI to identify decision options by commanders and the CINC, or their staffs. AI may then expedite the recommendations of munitions loads, fuzing, weapon systems, aircraft configurations, optional air support and flight route, altitude and speed based on current conditions to attack a specific target, aim points relative to its location, terrain, weather, deconfliction with other coordinated support/attacks and defensive threats.

A combatant commander or the CINC could finally delegate the authority to a staff to launch via a tasking order or execution message.

From my experience at the air operations center level, AI could save 48 hours in the planning and coordination phase. At the tactical unit level, it would save two hours of mad scrambling to prepare aircrews to launch each mission of a total air campaign.

Lt. Col. Russel A. Noguchi,
USAF (Ret.)
Pearl City, Hawaii

Once Upon a Time

In the article "How the Air Force and Space Force Combined to Defeat Iran's Missiles" [January/February, p. 34] "decoration creep" has apparently taken over the Air Force. Too bad. The Silver Stars and Distinguished Flying Crosses lavished upon F-15E crews for intercepting the Iranian drone and missile barrage are an insult to Airmen who have previously been so awarded.

I read and reread the account of the night's activity but never found an instance when the aircrews were subjected to enemy fire against their aircraft. The most I found was the threat—unrealized—of ground explosions as they recovered and launched aircraft. (And were they really going to stay in the bunkers and not relaunch aircraft because of the Red Attack warning?! How comforting that would be for folks depending on them for defense!)

A "routine" Thud mission into North Vietnam was more deserving of award recognition than the "turkey shoot" of that night. I characterize the F-15E work that night as what would be required in an Operational Readiness Inspection—with the aircrew-satisfying addition of live armament.

Lt. Col. Garwin Smith,
USAF (Ret.)
Maryville, Tenn.

Still Waiting

In regards to the article ["KC-46 Mission Capable Rates Slipped Further from Goal in 2024," Feb. 7] by John Tirpak, the USAF was told that the Frankentanker (aka KC-46) before it was built would be a troublesome platform. And here we are years behind schedule with an aircraft that has significant issues from a company, Boeing, that can't seem to fix them.

Stop the financial bleeding, the USAF needs a refueling platform that

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INDEX TO ADVERTISERS

Rolls-Royce ..... Cover II
USAA ..... Cover IV

Doolittle Raiders Memorial Toast 5
Shop AFA ..... Cover III

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Col. Clyde Romero,
USAF (Ret.)
Marietta, Ga.

Name the Target

President Donald Trump on more than one occasion has mentioned a "Golden Dome," or missile defense, for the U.S. similar to what Israel has successfully employed against Gaza and Iranian missile attacks. The January/February issue ["World," p. 17] defined this objective as a "space-based ... system." Note that the Iron Dome as presently employed by Israel is a ground-based system.

I have had the opportunity and privilege of working on both types of systems, first in the '70s on the Army's Ballistic Missile Defense Program (BMDP, a ground-based system); and later in the '80s on President Ronald Reagan's Defense Technology Study Team (DTST, aka "Star Wars," a space-based system).

Any missile defense has to contend with three basic challenges: first, detect the threat (in the presence of jamming, weather, or other clutter) where the threat is the reentry vehicle (RV) with a conventional or nuclear warhead); second, discriminate or find the threat amid multiple objects associated with penetration aid systems; and finally, destroy the threat using either kinetic or directed-energy systems.

Detection is probably the easiest given the sensors and networks currently available. Discrimination is much harder given the choices available to the offense here, including chaff, physical and electromagnetic decoys, and during reentry, the break-up of associated tankage accompanying the RV.

Destruction is a technology and a timing problem. The Golden Dome uses kinetic interceptors as was considered in the BMDP (nuclear was an earlier choice but abandoned due to the fratricidal effect of the high-altitude electromagnetic pulse that would have been created).

The DTST considered using directed energy from several large orbiting lasers, and even focusing the X-rays from a nuclear device, but both were eventually abandoned. The costs involved didn't balance with the deployment and technology risks.

Consider the timing problem: At reentry, depending on the threat trajectory or reentry angle, there are only seconds to discriminate and destroy an RV, given that a nuclear weapon detonates at altitude for maximum effect. Earlier in the trajectory, before apogee, the threat deploys its penetration aids and could present an easier target. The most effective way to destroy the threat, of course, would be to destroy the missile during the launch phase before it deploys the RV or its pen-aids.

However, it's not very practical.

So those are all the problems. What are the solutions being discussed now, I don't know. Maybe there are technology breakthroughs with directed-energy weapons and artificial intelligence (AI) that will make them all moot. I would like to think so.

In the future it should be made clear what threat is being discussed: short-range ballistic missiles, or intercontinental ballistic missiles. The former is what Israel's Iron Dome is defending against, and is only applicable to U.S. forces in theater, for example. The latter was the BMDP and DTST threat. The threat from submarine launched ballistic missiles (SLBM) is extremely difficult and differs in many respects from the discussion above and is not considered here.

Missile defense against any of the threats discussed will be extremely difficult and technologically challenging. It should also be a challenge worth accepting considering it could mean national survivability.

Peter Hansen
Torrance, Calif.

Pride and Commitment

Your article in "World: Patches, Nail Polish, Shaving: Dress, and Grooming Standards," [January/February, p. 19] sent me scurrying to the internet to read all the gory details in the latest Air Force dress and appearance instruction, still known by old-timers as "35-10."

During my Active-duty days, I prided myself in being a "sharp troop." Sure, there was that mustache that somehow kept creeping outside the vermilion of my mouth when I was a technical sergeant. Then there was the time one of my senior NCOs challenged my flattop for being too tall. Two blemishes over 40-plus years on Active duty isn't too bad.

But I digress ...

I applaud Secretary of the Air Force Gen. David W. Allvin for moving forward from what appears to have been the kinder-gentler Air Force that was portrayed in the previous instruction. Imagine a full-color visual aid therein depicting 60 shades of acceptable nail polish shades (none for men), plus 12 more that were verboten. Then there's the six photos of a female eye showing OK and not-OK eye makeup combinations.

Finally, 11 photos and three figures of acceptable female hairstyles with special attention to the wearing of a ponytail.

Happily surprised to read that the "gig line" is back. We first met in basic training in 1968 and it's been a part of my getting-dressed process ever since.

The general mentioned the elimination of the duty identifier patches. The old instruction had a list of over 130 now defunct patches. It looked to my nescient eye that the patches started out as a good idea to highlight the wearer's functional area in the absence of an occupational badge on the operational camouflage pattern shirt. Most observers would relate to ATC (Air Traffic Control), SF (Special Forces), CE (Civil Engineering), Cyber but evidently nobody wanted to be left out and soon requests were granted for any and all.

The abstract result: 3E3 (Structural Specialist), 2MO (Missile and Space System Maintenance), GHOST (Golden Hour Offset Surgical Team), IEEM (International Enlisted Engagements Manager), VACE (Verification and Checkout Equipment) and the like. The latter identifiers don't exactly answer the question, "What did you do in the war, daddy?"

I even watched General Allvin's video explaining his rationale for elimination of the patches. I had to chuckle when he said, "as we identify as one type of Airman or another, with one specialty or one skill set or another, we really diminish ourselves." Ironically, the general spoke these words while wearing his zipper-front blue jacket with "Dave Allvin" and his pilot wings monogrammed on the front.

I get it! I really do. That's why they call it the "Air" Force and not "Ground" Force. All Airmen know and love the opening line of the Air Force Song: "Off we go into the wide blue

yonder. ..." It still makes my chest swell to hear, but makes me choke up too as I get older as well.

Col. Bill Malec,
USAF (Ret.)
O'Fallon, Ill.

Shared Vison

An excellent article on rethinking defense policy ["A Call for a New NSC-68 and Goldwater-Nichols Reform," p. 42] was diminished by a couple of flaws and the lack of some bold reform ideas. The caption, "Led by the Air Force, the U.S. crushed Iraq's Army ...," once again scratched old wounds by minimizing the significant contributions of the other services.

The Air Force just needs to drive a stake in the notion that airpower can be victorious without ground and naval forces. Also, the continuing harping on the age of the B-52 (72nd anniversary of first flight and projected service life of 100 years) leaves out the new models and major upgrades.

The role, value, and vulnerability of our majestic carriers also needs to be rethought.

Col. Michael R. Gallagher,
USAF (Ret.)
Eugene, Ore.

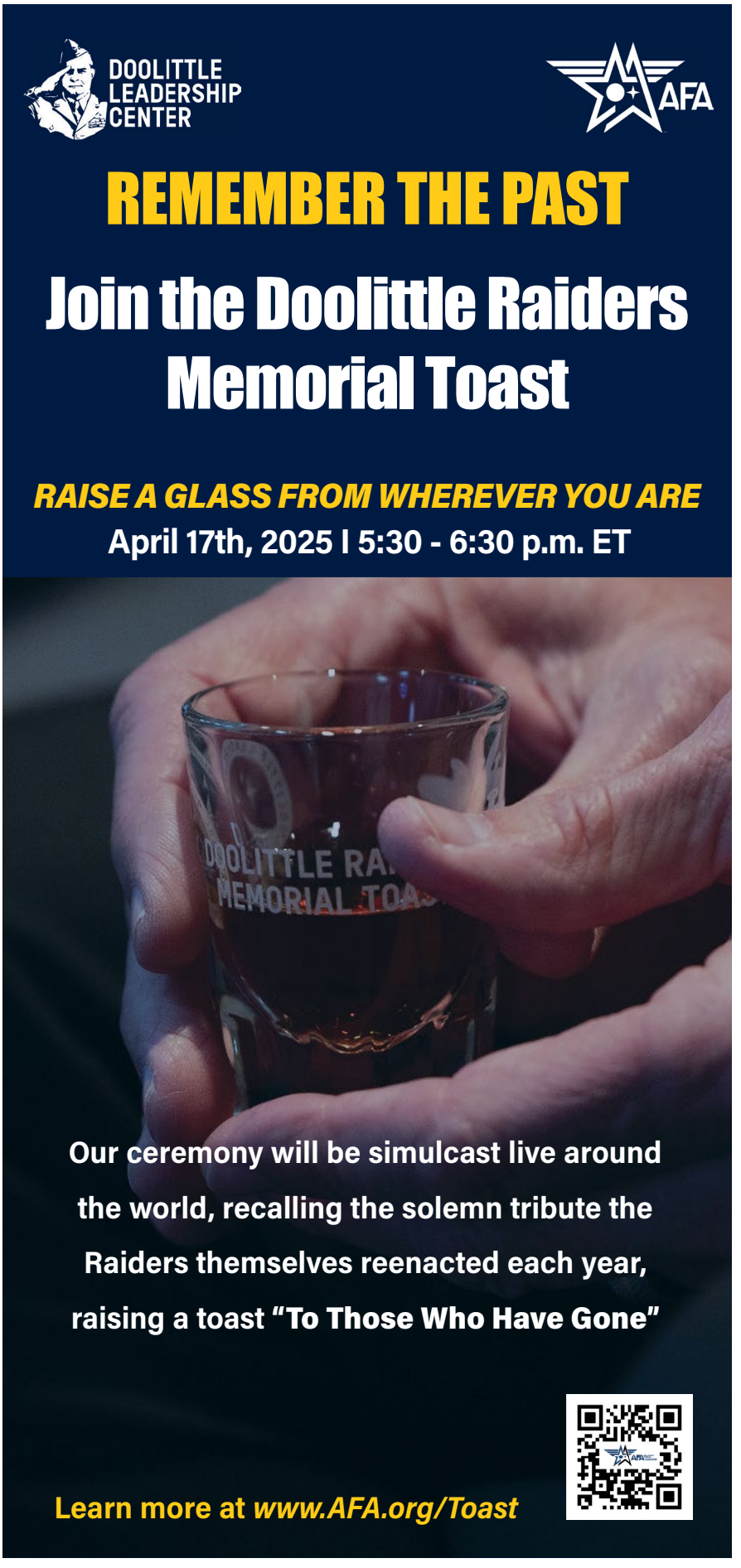
Begrudging Acceptance

I find the article on William Momyer ["Heroes and Leaders," January/February, p. 56] interesting. It bothers me that Air Force leadership allowed its pilots to operate under such stupid restrictions. I volunteer at a local museum that has an F-105. I tell visitors the rules of engagement (ROE) F-105 pilots flew under—not attacking MiG bases, portions of Hanoi and Haiphong being off limits, to name a few—and they are in complete disbelief.

While I am sure many Air Force generals were disgusted with the ROE, none offered to resign. I have studied the use of airpower in Vietnam and have the utmost respect for the men who flew in Rolling Thunder.

Maybe I am being extremely harsh, but it seems to me Rolling Thunder accomplished one thing: It ensured the North Vietnamese had a constant pipeline of POWs to torture.

TSgt. Joe Domhan,
USAF (Ret.)
West Babylon, N.Y.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By John A. Tirpak

New Undergraduate Pilot Training Program Targets 1,500 Pilots Annually

The Air Force is overhauling Undergraduate Pilot Training (UPT), moving to a hybrid private/government instruction program that officials at Air Education and Training Command (AETC) expect will reduce overall course time while achieving, within two years, USAF's elusive goal of producing 1,500 new pilots annually.

AETC has for years struggled to increase pilot production. Its aging trainers—the T-6 Texan II and T-38 Talon—can't deliver the necessary flying tempo, and their replacement—the T-7A Red Hawk—is mired in development delays and still years from operational service.

To cope with that, AETC's new plan offloads much of the basic, initial instruction to a commercial, university-based program, while retaining military-specific elements at Air Force training bases. That combination should increase throughput.

"If the plan comes to fruition, as we think it will, this will be the new way of doing Undergraduate Pilot Training," said AETC Commander Lt. Gen. Brian S. Robinson in an interview.

The new construct will give flight students 110 flying hours over 139 days at one of four flying universities, in a course now called Initial Pilot Training (IPT). Upon completion, students will receive their private pilot licenses—with instrument and multi-engine ratings—under FAA Part 141 standards. They will then transfer to one of USAF's four UPT bases, where they must complete a military-specific course in the T-6 and the T-38 Talon. Silver wings will be awarded to officers who successfully complete both courses.

Jud McCrehin/Staff

Using private schools for basic flying skills represents "a new way of doing Undergraduate Pilot Training," says Air Education and Training boss Lt. Gen. Brian Robinson.

The expected 1,500 additional pilots a year will fill both fixed-wing and rotary-wing cockpits and also include some international students. The 1,500 is "inclusive of the entire requirement that we have," Robinson said.

The Air Force tested the concept, completing "Small Group Try-Outs" with two private training programs: the Brunner Aerospace flight training program in Georgetown, Texas, and the University of North Dakota's Aerospace Foundation flight training program in Mesa, Ariz. About 32 students went through each program.

"Every school is slightly different, but the FAA part 141 requirements are standard," Robinson said. The first group finished in September 2024, and went from there to an abbreviated UPT program at Columbus Air Force Base, Miss. All but one received Air Force wings in early 2025; one candidate decided flying for the Air Force was "not for them," Robinson said. A second group of students started their follow-on UPT course at Columbus in March.

The program will ramp up fast. The Air Force expects to produce about 100 pilots via the new hybrid system in 2025 and 750 in 2026, Robinson said. By 2027, all Air Force pilots will go through the new program.

"We'll be running ... the legacy UPT and the IPT at the same time," for about a year, "just because ramping up all at the same time is not really doable," Robinson said. "We have to do it one class at a time, and then one base at a time as we expand it."

Beginning in 2027, each of the Air Force's UPT bases—Columbus; Laughlin Air Force Base, Texas; Sheppard Air Force Base, Texas; and Vance Air Force Base, Okla.—will train about 425 pilots a year.

UPT 3.0?

The new approach comes only two years after AETC rolled out UPT 2.5, which was meant to both bridge from the old mix of trainer aircraft to the new, while injecting more simulation and technology in the program. The idea then was that students could have the flexibility to surge ahead if they mastered a particular phase of instruction quickly, or spend more time if needed on another phase. The aim was to reduce washouts if students didn't keep up with their class' progress.

That plan also depended on the T-7 for more of the overall training effort. But delays to the T-7 and flying hours deficits forced a further rethink.

In the most recent curriculum, students completed basic flight screening and then went to a UPT base, "where we would take somebody with really no flying hours ... and take them all the way

through [becoming] a fully qualified pilot in the T-6," said Brig. Gen. Matthew Leard, director of plans, programs, and requirements for AETC.

"This is where we've been challenged," Leard said: "getting enough flying hours in the T-6 to actually get 1,500—roughly—pilots a year."

The Air Force's trainer aircraft all reported mission capable rates below 65 percent in fiscal 2024, well below the intended 70 percent threshold. The mission capable rate for the T-6A slipped 8.57 percentage points from 2023 to 2024, while the T-38 dropped by 1.02 percentage points and the T-38C declined 2.68 percentage points.

The Air Force retired its last T-1 Jayhawk trainer in December without a direct replacement.

DIFFERENT TRACKS

Plans call for future mobility students to follow a simulator-heavy curriculum after IPT, while those on the fighter and bomber track will train on the T-38 until the T-7s come on board. The T-38 is now more than 60 years old; it was to have retired in 2022, but is being extended as the Air Force awaits the T-7.

It could be a while: The T-7 won't start low-rate initial production until the spring of 2026 at the earliest, and initial operational capability is only tentatively set for 2027. Software issues, escape system design challenges, and supply chain bottlenecks have contributed to delays. To speed up testing, the Air Force bought four additional "production representative" test aircraft last year.

In working up to the new construct, Leard said, "we looked at … what are the things we really need those [military] flying hours to focus on … and then let's save the flying hours and [instructor pilots] to focus on that." Leaders concluded they did not need to spend precious T-6 hours on "basic airmanship … instrument procedures, navigation," he explained. So they looked to civilian institutions that could do that well: "Places like Embry-Riddle, UND, all of that," he said.

After students transition to UPT, they'll get 108 training days comprised of 55 hours in the T-6 and 50 hours in its simulator. Combined with the 140-hour IPT program, pilots will graduate UPT with nearly 200 hours of actual flying time, compared with about 127 hours under UPT 2.5—a 57 percent increase in flying hours.

"They actually get more flying hours, total, between the two than they get today," Leard said. The T-6 portion of the syllabus "is actually shorter than it is today … because they've [already] accomplished the competencies that we need them to understand … general aviation science, instrument skills, private pilot certificate, and then the multi-engine," he said.

SAME MONEY, MORE PILOTS

The cost difference between the old and new system is a wash, Robinson said.

"At the individual level, per pilot, it actually is cheaper," he said. "It's faster … and we think it's going to be better. We're still collecting the data on that, [but] because we are going to … get … about 250 more pilots through the system in a year, it's about a break-even."

Leard said AETC was able to move quickly, because "we are literally just paying the tuition for the students." A longer-term contract will be negotiated, he said, but the Air Force bought "education service agreements, where we can go to these universities and just say, 'Hey, look in the course catalog. … We'd like 27 of those.'"

Long term, he said, "this is an integral part of our future pilot training pipeline."

The new system should also help the enduring challenge to "burn down the glut of officers awaiting pilot training," Robinson said. Air Force Academy and ROTC students all graduate "in a very condensed period of time" each spring, but pilot training classes have to be spaced out, forcing some pilot candidates to wait. Using four external programs can reduce that waiting time.

IPT IS NOT COLLEGE

The IPT students train in flight suits, live in university-provided housing, and eat in the university dining halls. "They still have a senior ranking officer that's there [to] make sure that everybody remembers that they're still in the military," Leard said.

Student housing is not in dormitories, but "two-bedroom apartments," Robinson explained. "These are commissioned officers, and we want to make sure it's kind of a step above a college." Time is compressed, though. "I'll tell you what: With 110 hours in 140 days, they don't have a lot of spare time."

Trainer aircraft will feature "an all-glass, integrated avionics suite" to acclimate new pilots to the kinds of displays they'll see in aircraft like the F-35 and KC-46, Leard said.

"We need to start building pilots that learn from day one how information is visualized, ingested [and] acted upon," he said. "Most of the schools are going with, like a [Cessna] 172, Piper Archer, or like a [Diamond Aircraft] DA-40 … and then mostly [Piper] Seminoles or DA-42s for the multi-engine phase. But again, the same avionics throughout the pipeline."

But once those pilots get to the T-6, an early 1990s design with multifunction displays presented in a more traditional format, there could be some regression, Robinson said.

"Each school has a little different take," Leard said. Some use more advanced simulation than others.

But the FAA Part 141 syllabus "is fairly standard." The Air Force changed the T-6 syllabus to adjust to the new program.

For the duration of the IPT phase, students are on temporary duty from their final UPT training base. There will be just a three-week break between IPT and the T-6 phase to accommodate the change in station, to ensure that students don't get rusty.

Creating more new pilots only solves part of the problem. Training them to be effective operators will take more time, money, and effort, as well. For more information, see "Fixing the Air Force Pilot Crisis," p. 48.

LINGERING ISSUES

The pilot enterprise has never had a shortage of volunteers for pilot training slots, Robinson said. With plenty of candidates, the Air Force can afford to be highly selective.

But UPT production has been held back not only by sustainment challenges, but by a shortage of simulator instructors. With uniformed pilots needed in operational cockpits and staffs, the Air Force has gradually added more civilian instructors at UPT bases—when they can be found.

"There's just a shortage of people wanting to go [be] the sim instructors at [the Laughlin and Columbus] locations," Robinson said. When that happens, military instructor pilots have to fill in.

HERE COME MORE PILOTS

Robinson said the changes coming with IPT are interlocked with an ongoing servicewide Aircrew Crisis Task Force, which has been laboring to increase the number of operationally trained pilots available for all kinds of assignments.

"We're working on multiple … segments" of the UPT pipeline "at the same time," he said. Air Force headquarters is working on ensuring units will be ready to take on more pilots as the system matures.

Fighter Training Units in 2027 must have the capacity to absorb the additional pilots, Robinson said. That means increasing their weapon sustainment funding now and ensuring enough adversary air is available for training later.

U.S. Air Force pararescuemen from the 82nd Expeditionary Rescue Squadron practiced a High Altitude Low Open (HALO) parachute jump from a C-130 Hercules near Camp Lemonnier, Djibouti, in February. The technique is responsible for personnel recovery operations across the Horn of Africa.

Tech. Sgt. Jana Somero/ USAF

Flyovers at football, baseball, and soccer games are routine. Flying over outdoor hockey isn't. An Ohio Air National Guard F-16 Fighting Falcon from the 180th Fighter Wing overflew Ohio Stadium in Columbus where the Columbus Blue Jackets took on the Detroit Red Wings before 94,751 fans. Also joining in the flyover: a second F-16 from the 180th and a KC-135 tanker from the 121st Air Refueling Wing.

Tech. Sgt. Mikayla Gibbs/ANG

The past was prologue in early March as a new T-7A Red Hawk joined a vintage P-51 Mustang and an F-35A Lightning II in formation over Edwards Air Force Base, Calif., following the annual Red Tail Rendezvous event honoring the Tuskegee Airmen. The 412th Test Wing, which is putting the T-7A through its paces, hosted the unique formation, which took place as the T-7A was completing a test mission, presenting a unique photo opportunity. The Air Force expects to get the first production contract for T-7s in fiscal 2026.

Christian Turner/USAF

Senior Airman Henry Maddock, a patrolman with the 375th Security Forces Squadron, fires an M240 light machine gun during 12th Air Task Force training on Camp McGregor, N.M. Activated in September 2024 and based at Scott Air Force Base, Ill., the 12th is the first of six ATFs working their way through the Air Force Force Generation cycle. ATFs are an interim unit of action and will give way to Deployable Combat Wings in 2027 as the Air Force completes a transition to a new rotational deployment model.

Senior Airman De'Quan Simmons

VERBATIM

Jud McCrehin/Staff

Mission Ready

"A mission-ready Airman doesn't mean that we're no longer focused on our technical expertise. Actually, quite the opposite. We need your technical expertise in that core baseline, but we don't want to constrain our Airmen to that. We want to start exercising and aligning around an assigned mission and taking a small team that's multi-capable, maybe expertise at the one or two each, but then with a common understanding of what everybody brings to the fight, where our strengths and weaknesses are, and how we can adjust quickly to go execute that assigned mission."

—CMSAF John Flossi at the AFA Warfare Symposium.

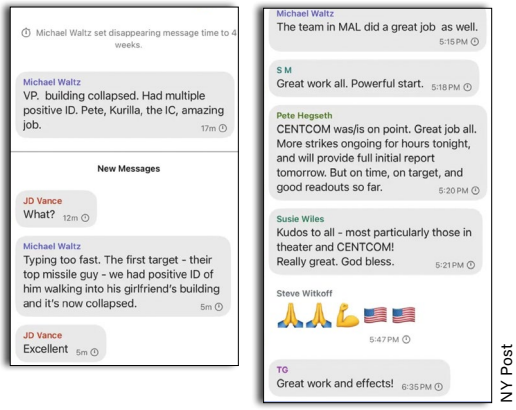
Generally Speaking

"We won World War II with seven four-star generals. Today we have 44. Do all of those directly contribute to warfighting success? Maybe they do. I don't know, but it's worth reviewing to make sure they do."

—Defense Secretary Pete Hegseth at a town hall of DOD personnel on Feb. 7, speaking on topics including deterring China and slashing Pentagon waste.

War Plans ...

"The world found out shortly before 2 p.m. Eastern time on March 15 that the United States was bombing Houthi targets across Yemen. I, however, knew two hours before the first bombs exploded that the attack might be coming. The reason I knew this is that Pete Hegseth, the Secretary of Defense, had texted me the war plan at 11:44 a.m."


Michael Waltz set disappearing message time to 4 weeks.
Michael Waltz
VP, building collapsed. Had multiple positive ID. Pete, Kurilla, the IC, amazing job.
17m
New Messages
JD Vance
What?
12m
Michael Waltz
Typing too fast. The first target - their top missile guy - we had positive ID of him walking into his girlfriend's building and it's now collapsed.
5m
JD Vance
Excellent
5m
Michael Waltz
The team in MAL did a great job as well.
5:15 PM
S M
Great work all. Powerful start.
5:18 PM
Pete Hegseth
CENTCOM was/is on point. Great job all. More strikes ongoing for hours tonight, and will provide full initial report tomorrow. But on time, on target, and good readouts so far.
5:20 PM
Susie Wiles
Kudos to all - most particularly those in theater and CENTCOM! Really great. God bless.
5:21 PM
Steve Witkoff
5:47 PM
TG
Great work and effects!
6:35 PM

N.Y. Post

—Jeffrey Goldberg, editor in chief of The Atlantic, in a bombshell article disclosing how top national security officials inadvertently added him to a group chat on the app Signal and discussed sensitive topics.

...Not War Plans

"Nobody is texting war plans. ... They know it's not war plans. There's no units, no locations, no routes, no flight paths, no sources, no methods, no classified information."

—Defense Secretary Pete Hegseth to reporters in Hawaii.

Strike Two

"I think they should make sure it never happens again. I wish they'd tell us, 'It will never happen again.' It's the first strike in the early stages of an administration. I don't know how many strikes you get. In baseball, you get three. Maybe this is worth two."

—Sen. Kevin Cramer (R-N.D.), a member of the Senate Armed Services Committee.

Back in My Day...

"A mentor of mine ... was having a conversation at the Air Force Academy just last week, talking about this F-15 that he flew back in 1991-ish. And they're still flying that same airplane, so that's 34 years ago. And he reflected: What if in 1990 when he graduated from the Air Force Academy, he was having a conversation with someone about the airplanes that were 34 years before that? He would've been talking about P-51s. And if you can imagine having a discussion about flying P-51s, F-86s, F-100s, et cetera, in 1990, that would have been unimaginable. But here we are 30 years later and we're still flying the same airplanes."

Staff Sgt. Sean Worrell

—**Maj. Gen. Joseph Kunkel** at AWS.

Jud McCrehin/Staff

Guardian Superiority

"We must simultaneously be ready to defend American spacepower as well as to protect our forces against hostile spacepower because that is the true essence of space superiority, which is the formative purpose of the U.S. Space Force. Space superiority is the fundamental difference between a civil space agency and a warfighting space service. It is the distinction between a company's employees operating commercial satellites and Guardians conducting combat operations to achieve joint objectives. If you want to understand the evolution from Air Force Space Command into Space Force, it all comes down to this fundamental shift. It is now our job to contest and control the space domain, to fight and win so that we assure freedom of access for our forces while denying the same to our adversaries."

—CSO Gen. B. Chance Saltzman at the AFA Warfare Symposium.

FACES OF THE FORCE

Justin Pacheco/USAF

Capt. Anna Mason transitioned from cadet to aeronautics instructor at the U.S. Air Force Academy, inspiring future Air Force leaders. Selected through the Graduate Studies Program Pipeline, she returned after earning an advanced degree and working in military intelligence. Mason works to make aeronautics more accessible, encourages more students to pursue it, and mentors cadets academically and personally. Her teaching style and dedication to student success help shape the next generation of pilots and engineers. "I'm loving my time here; this really is buckets of fun," Mason said. "It's so easy to stay motivated because you see the impact immediately. You see the light bulb go off in the cadets' heads, and then you see them go off and do extraordinary things."

Senior Airman Sterling Sutton

Tech. Sgt. Jarvis Mitchell of the 6th Logistics Readiness Squadron risked his life to save a man trapped in a burning home after Hurricane Milton in Florida in October. While helping his family during a power outage, he saw flames at a neighbor's house and acted immediately. Using buckets of water and dirt, he extinguished the fire blocking the exit and rescued Dave Gilley Jr. "I don't see myself as a hero. I think anyone would have done the same at that moment. I'm grateful I was there at the right time to help," said Mitchell. Lt. Beau Delis, 6th LRS Officer in Charge, was not surprised by Mitchell's actions and bravery, nominating him for the Air Force Sergeants Association Pitsenbarger Award.

Miriam Thurber/USAF

Chief Master Sgt. Tiffany Zaloudek made history Nov. 1 as the first female survival, evasion, resistance, and escape (SERE) specialist to reach the highest enlisted rank in the U.S. Air Force. Earning her SERE beret in 2007, she defied doubts and exceeded training standards, later becoming the first woman in U.S. Air Force SERE to qualify as a Military Free Fall Jumpmaster and Test Parachutist. Despite challenges, Zaloudek embraced her identity and now uses her platform to encourage women to pursue their goals. "Strength and femininity go hand-in-hand," Zaloudek said. "You don't have to act or look a particular way to do well in a career dominated by men."

Senior Airman Nicholas Paczkowski

U.S. Air Force **Lt. Col. Brandon Taylor**, 29th Attack Squadron commander, rushed to aid an injured driver after witnessing a car crash while delivering care packages to Airmen last winter. Hearing the driver's screams, Taylor and another motorist freed the man, assessed his injuries, and stabilized his fractured leg until paramedics arrived. A former Navy rescue swimmer, Taylor credited his Air Force Tactical Combat Casualty Care training. "The small things you do can make a difference until help arrives," he said.

Airman 1st Class Amy Kelley/USAF

U.S. Air Force **Capt. Theresa Ziegler**, a flight nurse with the 18th Aeromedical Evacuation Squadron, received the Air and Space Achievement Medal on Feb. 18 for providing lifesaving care to a passenger in distress during a commercial flight. Two hours into a 10-hour flight from Tokyo, Ziegler responded to an intercom call for medical assistance. Working with a civilian nurse, she stabilized the passenger, monitored him for eight hours, and coordinated with the pilots and an on-call doctor. "I am very proud that we have a member in our squadron who was able to respond as quickly and as effectively as she did," said Maj. David Madrid, 18th AES clinical management flight commander, who was instrumental in Ziegler receiving the medal.

Staff Sgt. James Fritz/USAF

Senior Master Sgt. Scott Ebert and **Senior Airman Siena Ebert** are more than Airmen—they're family. As part of Exercise NEXUS FORGE 2025, the father-daughter duo works together in the 624th Aeromedical Staging Squadron, helping stabilize and transport injured service members. Scott, nearing retirement, oversees medic training, ensuring readiness for high-pressure missions. Siena, acting as the "Bulldog," manages patient movement and safety, making critical decisions under tight timelines. "Our years aren't going to be long, but I'm thankful for this opportunity," Scott said.

Jonathan Arias Beltran

Pope Francis has appointed **Father Gregg Caggianelli,** an Air Force veteran and Florida priest, as auxiliary bishop of the Archdiocese for the Military Services, USA. Caggianelli, 56, has served in the Air Force for over 30 years and currently assists the chaplain at the U.S. Air Force Academy. Ordained in 2002, he has dedicated his ministry to serving military personnel. "I look forward to giving my life in service of our Lord in the care of our Soldiers, Sailors, Airmen, Coast Guardsmen, Guardians, veterans, and diplomats throughout the world," he said.

Anna Tripp/National Park Service

Dena Lowe's journey from Air Force Security Forces to the National Park Service reflects a lifetime of resilience and service. Enlisting in 1986, Lowe became one of the first female security police officers sent to Germany during the Cold War. She later led a fire team in the Gulf War before leaving the military to raise her daughter. Transitioning to civilian life, she built a successful construction business before joining the National Park Service in 2007. Now at Wolf Trap National Park in Vienna, Va., Lowe continues her mission of service, embracing her lifelong spirit of exploration.

Tell us who you think we should highlight here. Write to afmag@afa.org

Boeing won the competition to build the Next Generation Air Dominance fighter, dubbed the F-47. The Air Force obscured details of the aircraft's design. The first-ever sixth-generation fighter promises new advances in low-observability, speed, and reliability.

COMBAT AIR FORCES

The F-47: Next Generation Air Dominance

Boeing Wins Contest to Build the Next Manned Fighter.

By Chris Gordon and John A. Tirpak

When President Donald Trump announced March 21 that Boeing would build the Next-Generation Air Dominance fighter, he unleashed a series of superlatives: faster, more maneuverable, more stealthy, "the likes of which nobody has seen before."

"In terms of all of the attributes of a fighter jet, there's never been anything even close to it, from speed to maneuverability to what it can have, to payload," Trump said from his desk in the White House's Oval Office, flanked by Defense Secretary Pete Hegseth, Air Force Chief of Staff Gen. David W. Allvin, and Lt. Gen. Dale R. White, the military deputy to the Assistant Secretary of the Air Force for acquisition, technology, and logistics.

Boeing defeated Lockheed Martin in the contest to build the world's first sixth-generation fighter, named the F-47 in honor of the P-47 Thunderbolt, the year in which the Air Force was founded, and the second Trump administration, the 47th in American history.

The future of this Next Generation Air Dominance (NGAD) fighter had been in question for nearly a year, having been paused by former Secretary of the Air Force Frank Kendall last summer out of concern that its costs were too high and its requirements might be dated compared to new weapons coming out of China. Hegseth said the Biden administration had been "prepared to potentially scrap it."

Kendall had ordered an internal review and appointed a senior panel of former Air Force Chiefs and other officials to review the options; they concluded the system was needed late last year, and Kendall acknowledged that given the timing, the decision on the airplane's future was best left to the successor administration.

The F-47 joins two other new aircraft designations announced weeks ahead of the F-47 unveiling, when Allvin disclosed that the first two Collaborative Combat Aircraft would be designated YFQ-42 and YFQ-44. The two CCAs, the former built by General Atomics Aeronautics and the latter by Anduril Industries, are designed to operate with manned aircraft and are in the prototype stage today.

The F-47 is designed from the start to operate in concert with CCAs—"many many drones," Trump said.

For Allvin, the announcement was a continuation of his pitch for "more Air Force," a pitch he made at the AFA Warfare

Symposium: "I want to give the President as many options as we possibly can," he said there. "So that means, yes, keep on with modernization. Yes, NGAD. Yes, CCA. Yes, survivable bases."

NGAD will succeed the fifth-generation air-to-air F-22, built by Lockheed Martin, as the Air Force's air superiority fighter, but Trump and Allvin promised it will be built in greater volume than the F-22 Raptor, which suffered a series of cuts and ultimately was limited to 186 jets, about a quarter of the original plan.

"Compared to the F-22, the F-47 will cost less and be more adaptable to future threats—and we will have more of the F-47s in our inventory," Allvin said in a statement. "The F-47 will have significantly longer range, more advanced stealth, be more sustainable, supportable, and have higher availability than our fifth-generation fighters. This platform is designed with a 'built to adapt' mindset, and will take significantly less manpower and infrastructure to deploy."

Allvin praised the combat capabilities of the F-47, saying "We believe that this provides more lethality: It provides more modernized capability in a way that is built to adapt. Along with our Collaborative Combat Aircraft the President talked about with drones, this is allowing us to look into the future and unlock the magic that is human-machine teaming. And as we do that, we're going to write the next generation of modern aerial warfare."

Allvin said the program was structured to put "more control in the hands of the government, so we can update and adapt at the speed of relevance, at the speed of technology." The Air Force chose a cost-plus-incentive-fee contract structure for F-47 engineering and manufacturing development. Speaking on background, an Air Force official said, "the contract will produce a small number of test aircraft ... and competitively priced options for low-rate initial production aircraft." Further details were withheld for security reasons.

Meanwhile, CCA are maturing. The YFQ-42A and YFQ-44A are scheduled to fly this summer and are designed to carry missiles, but the role of future CCAs could include a variety of missions, including electronic warfare, sensing, and more.

The Air Force has invested billions to develop the F-47 so far, and has billions more planned to invest in future research and development to ensure it will remain the most advanced fighter jet in the world.

The F-47 is seen as the high-end part of a "high-low" mix that will include the F-35 and CCAs. The F-35 is a multirole, fifth-generation jet optimized for air-to-ground attack and operating as a sort of combat quarterback; NGAD has been described as an air-to-air fighter and penetrator designed to operate in contested environments and to fly deep into enemy territory leveraging its stealth and electronic warfare capabilities to remain undetected and to protect penetrating bombers.

The engines competing to power the NGAD—GE's XA102 and Pratt & Whitney's XA103—have passed Design Reviews for the Next-Generation Adaptive Propulsion program, and employ new technology for increased thrust and efficiency, meaning greater range.

The Navy is also developing a next-generation fighter and intends to award a contract for its sixth-generation F/A-XX in the coming months. The two programs are separate, however, unlike the F-35 which produced Air Force, Navy, and Marine Corps variants.

BIG WIN FOR BOEING

Boeing's selection is a major coup at a time when America's largest aircraft maker has been struggling in every aspect of its business. Boeing has suffered cost overruns, delays, and technical challenges on a host of programs, from the much-delayed VC-25B presidential aircraft known as Air Force One to the KC-46 Pegasus tanker, the T-7A Red Hawk trainer, its space and commercial aircraft programs, and even its commercial airliners.

The delays on the new "Air Force One" even prompted Trump, weeks before the F-47 announcement, to suggest the military should look at alternative integrators (Boeing is responsible for fitting out 747 airliners for the job.)

In winning a fighter competition, Boeing also gains a foothold into a business that had seemed to belong to Lockheed, which won the F-22 and F-35 competitions. Boeing's only other fighter is the F-15EX, based on a decades-old airframe design.

The F-47 will join the B-21 bomber as the Air Force's second sixth-gen jet, a generation Allvin promised will deliver "next-generation stealth, sensor fusion, and long-range strike capabilities to counter the most sophisticated adversaries in contested environments."

Renderings of the F-47 intentionally conceal many of its features, but indicate distinct differences from the fifth-generation F-22 and F-35. The F-47 is pictured with a conventionally stealthy nose and bubble canopy, a chiseled chine, and a flattened overall fuselage. It appears to feature canards, or a forward winglet, as well as wings that appear to be canted at a distinctive upward angle, features not typical of previous stealth designs.

These features might lend themselves to what Allvin called "significantly longer range." The F-22 can fly more than 1,850 miles when fitted with two external wing fuel tanks before it needs to be refueled.

Air Force leaders have discussed the possibility of building two variants of the plane in the past, one larger version with greater range to cope with the great distances of the Pacific theater. The announcement made no indication of variants of the aircraft, however.

Allvin said X-planes have been testing NGAD technologies for the past five years, "flying hundreds of hours, testing cutting-edge concepts, and proving that we can push the edge of technology with confidence." The flying campaign has been "accelerating the technology, refining our operational concepts, and proving that we can field this capability faster than ever before," he said. As a result, he promised: "This fighter will fly during President Trump's administration."

That means the jet will fly within four years; by comparison, it took six years for the F-22 to go from contract to first flight.

Air Force officials first made reference to flying NGAD prototypes in 2020, and former Secretary Frank Kendall later revealed that X-plane prototypes flew even earlier than that, in the mid-2010s.

Allvin also promised that the F-47 "will cost less and be more adaptable to future threats—and we will have more of the F-47s in our inventory."

The flyaway cost of the F-22—including just the cost of one aircraft, and not research and development, military construction, or any other nonrecurring engineering costs—was about $140 million. All in, F-22 costs equate to about $350 million per jet, higher than expected because the Air Force ended up buying just a quarter of the jets planned.

Air Force officials have privately suggested they will build between 220 and 250 F-47s.

Allvin said the F-47 will also be "more sustainable, supportable, and have higher availability than our fifth-generation fighters," which could be references to enhancements in the hardiness of new low-observable surface treatments. In the

early days of stealth, those treatments were among the most expensive aspects of maintaining these jets. But advancements since then and included in the sixth-gen B-21 have been described as enabling that aircraft to be a "daily flyer," due to more resilient and contiguous stealth surfaces. The same principles are likely applied in the design of the F-47.

The F-47 was also designed with a "built to adapt" mindset, Allvin said, a likely reference to digital design and an open-systems architecture that will allow frequent changeouts of software, sensors, and other mission gear. He also said the fighter will "take significantly less manpower and infrastructure to deploy," suggesting a reduced dependence on ground equipment and more maintenance-friendly components.

Steve Parker, interim president and chief executive officer of Boeing Defense, Space and Security, said Boeing worked hard for the win: "In preparation for this mission, we made the most significant investment in the history of our defense business, and we are ready to provide the most advanced and innovative NGAD aircraft needed to support the mission."

Allvin offered a striking description of what the Air Force will gain with its next fighter jet. "With the F-47, we will strengthen our global position, keeping our enemies off-balance and at bay," he said. "And when they look up, they will see nothing but the certain defeat that awaits those who dare to challenge us."

AIRPOWER

Allvin Makes the Case for More Airpower

It's all about 'more options for the President,' CSAF says.

Jud McCrehin/staff

With unusual transparency, Chief of Staff Gen. David Allvin acknowledged risks the Air Force has taken that are creating "unsustainable" shortfalls in near-term readiness. Investing in "more Air Force" will reduce those risks and fund a more ready, effective Air Force.

By Chris Gordon

Air Force Chief of Staff Gen. David Allvin dialed up the intensity of his calls for "more Air Force" in March, laying out a bold and compelling case for why investing in U.S. airpower today delivers a more lethal, effective and flexible military now and into the future.

Allvin emphasized flexibility.

"That's what airpower provides: more options for the President—everything from rapid response all the way to decisive victory," he said, walking the stage at the AFA Warfare Symposium and speaking extemporaneously, with slides as prompts but no predefined script. "That is what 'Airpower Anytime, Anywhere' means. It's not just an aspiration. It's a promise that we have to uphold."

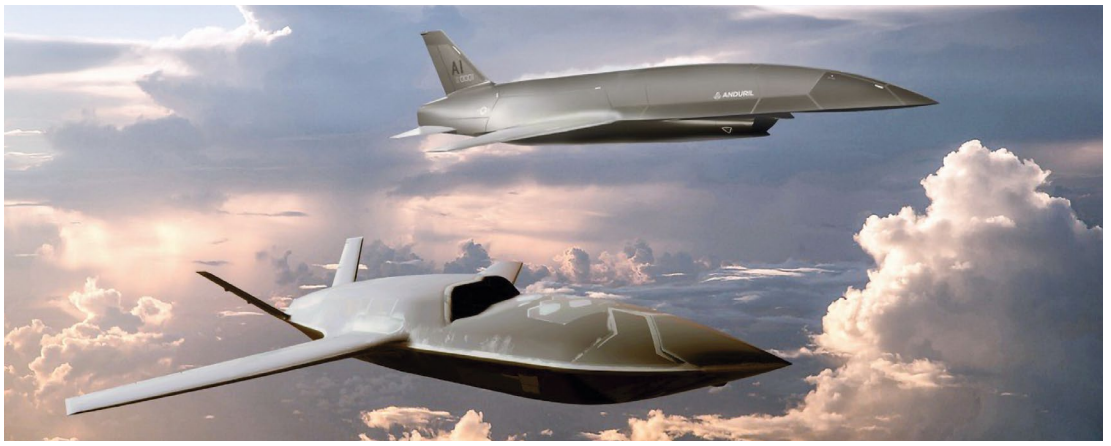
The Air Force has met its promises over the decades, he said, and done so convincingly, citing the heroics of Airmen under fire during last year's missile attacks on Israel, in which Air Force jets rose up to shoot down incoming rounds and help ensure none reached their intended targets. But the Air Force has also "made it look easy," he said, fueling capability at the leading edge by leveraging readiness across the rest of the force.

That's not sustainable, Allvin said. The Air Force must chart a new course with enhanced technology, modernized doctrine, and a new force design.

"More Air Force doesn't just mean more of the same," Allvin said.

THE FUTURE IS HERE

Within the month of March, Allvin revealed the Air Force's first-ever unmanned fighter aircraft, or Collaborative Combat Aircraft—General Atomics' YFQ-42 and Anduril Industries'



General Atomics Aeronautical Systems, Inc. and Anduril Industries

Concepts of the uncrewed fighter aircraft YFQ-42A (bottom) and the YFQ-44A are pictured in artwork. The aircraft are designed to leverage autonomous capabilities and crewed-uncrewed teaming to defeat enemy threats in contested environments.

YFQ-44—and then, just two weeks later, the Next-Generation Air Dominance manned fighter, the F-47.

The commitment to these new capabilities demonstrate a transformation in the works to a future generation of manned-unmanned teaming that goes far beyond the kinds of low-cost drones that have made their mark in the Russia-Ukraine war, for example. Although technology mogul and Trump adviser Elon Musk has argued that drones should supplant crewed aircraft, the Air Force says it is the combination of unmanned drones with crewed fighters that will give the U.S. the air superiority needed to deter and, if necessary, defeat peer rivals in the future.

"It's telling the world that we are leaning into a new chapter of aerial warfare," Allvin said. The first CCAs are expected to fly this summer; the F-47, built by Boeing, is expected to fly within less than four years.

YFQ-42 maker General Atomics, a privately held and proven supplier, cut its teeth in unmanned aircraft with the pioneering MQ-1 Predator and follow-on MQ-9 Reaper. Anduril, on the other hand, is an investor-funded startup created to disrupt the defense industry with a radical new approach to aerospace development. Its business is built on promising the Pentagon a 21st century, venture-capital funded means to develop less costly, more competitive weapons systems than traditional defense companies have been able to deliver.

CCAs will be a force multiplier for the Air Force, a means of generating "affordable mass"—the drones will cost between a quarter and a third of an $80 million F-35—while increasing dilemmas for an adversary. By bestowing the F designation on these first two CCAs—collectively dubbed Increment 1—the Air Force is making clear they will be offensive in nature, carrying weapons and operating in concert with manned aircraft.

"It's a recognition that we're moving into a new era of manned human-machine teaming," Allvin said in an interview.

But the CCAs are just one part of the solution. CCAs will fly with F-35s, initially, and with the F-47 later. Manned fighters will team with multiple CCAs, with Air Force leaders increasingly confident that a single pilot can control four or even more unmanned CCAs.

The 6th-generation F-47 will supplant the F-22 Raptor as America's premier air superiority platform. The cost is classified, but officials indicated they will acquire more F-47s than the 186 F-22s the Air Force bought in the early 2000s. Frank Kendall, the former Air Force Secretary, pegged the cost in the hundreds of millions of dollars per aircraft; the Trump administration did not share cost details. The administration said the new aircraft will outperform the F-22 in speed, payload, maneuverability, and stealth.

Just as the F-15 and F-16 presented a high-low mix of capabilities when they were introduced in the 1980s, the F-47 and F-35—not to mention CCAs—present a modernized version of that exquisite and workhorse kind of capability.

Lt. Gen. David A. Harris, Deputy Chief of Staff for Air Force Futures said this is the modern iteration.

"I still contend there is the high-low mix," Harris said. "You still need some of the exquisite and then you still need a lot of the war-winning mass as well. It's the combination of those together that really create the effect."

Brig. Gen. Ryan P. Keeney, director of Concepts and Strategy for Air Force Futures, framed the issue in more historical terms.

"We're in the third wave of how we provide airpower," said Keeney. "World War II was mass: We sent formations of B-17s over and our [circular error probable, a measure of a weapon's accuracy] was measured in miles, not in tens of feet."

Next, the Air Force emphasized precision, making individual platforms so capable, their weapons so accurate, that they could make up for any lack of mass with their precise accuracy.

Now the Air Force is entering the third wave, where precision remains paramount, but mass is again gaining in import as a means to overcoming increasingly sophisticated defenses. The aim is to mass-produce affordable systems, Keeney said, that can still deliver precision accuracy but to a far broader target set.

The F-47 NGAD platform, still to be named, will complement its planned fleet of 100 or more B-21 Raider stealth bombers. The Raider, now undergoing evaluation at Edwards Air Force Base, Calif., has been flying there since late 2023. Sometimes called the first 6th-generation aircraft, the B-21 offers advanced stealth and electronic warfare technology but was always intended to operate alongside a family of penetrating systems built around the Next-Generation Air Dominance fighter.

Maj. Gen. Joseph D. Kunkel, the Air Force's director of force design, integration, and wargaming, said every study and wargame he's participated in underscores the value of air superiority. "What we found is not only in the past, not [only] in the present, but in the future, air superiority matters," said Kunkel. "What this study told us is we tried a whole bunch of different options and there's no more viable option than NGAD to achieve air superiority in this highly contested environment."

Allvin argued likewise. "In this dangerous and dynamic time, I want to give the President as many options as we possibly can," Allvin said, two weeks before standing in the Oval Office with the President and Defense Secretary as they unveiled the first peak at the F-47. "So that means, yes, keep on the modernization. Yes, NGAD. Yes. CCA. Yes, survivable bases. Yes to all that. And yes to taking care of our Airmen, because that's what it's going to take."

PAYING FOR IT

Kunkel, Harris, and Allvin recently authorized a classified force design to spell out what the Air Force needs to succeed. That plan clearly includes B-21s and F-47s, CCAs, but an unknown number of F-35s, and with an uncertain future for the Next-Generation Aerial Refueler (NGAS), a next-generation airlifter, and more.

The Air Force's design approach is markedly different from the force designs offered by the other military services; the Marine Corps, by contrast, offered a highly detailed road map, trading heavy tanks and other weapons to become a lighter, more agile force better equipped to operate in the Pacific theater.

In contrast, the Air Force design is far less prescriptive, instead providing a framework intended to inform decision-making as the service works to counter evolving threats and navigate the challenge of constrained resources.

Allvin cited cuts to squadrons, the aircraft inventory, reductions to pilot training, and reducing operational readiness. Since the 1991 Gulf War, the Air Force cut 60 percent of fighter squadrons, 40 percent of Airmen, but only 15 percent of its installations. "That math doesn't work," Allvin said. "We have too much infrastructure. ... 20 to 30 percent too much. ... That is infrastructure that needs to be maintained, sustained, and doesn't necessarily provide more combat lethality. And oh, by the way, we need more Airmen to do that as well."

The age of the USAF airplanes now averages over 31.7 years each, up from 17.2 in 1994, he said. Aircraft availability meanwhile has plunged from 72.9 percent to 53.9 percent. And he said the Air Force is now understaffed by some 25,000 military and civilian jobs. Weapons system sustainment costs are also on the rise, Allvin said, citing data that showed the cost to sustain each aircraft had risen 23 percent in just five years.

"We are not getting more weapons sustainment for the dollar," he said. "When [planes] are older, you have to do more maintenance actions on them." Maintenance actions per flying hour more than doubled since 1997, from 1.8 to 3.6. The result, he said, is fewer flying hours: "This is not sustainable."

Such transparency about these challenges is unusual in a can-do Air Force that consistently delivers on what it is asked to do. "You wouldn't know this on the front line," Allvin said, "because of the miracles that are going on from our maintainers and those who are sustaining. We're making it look easy." But left unchecked, he suggested, the bills will eventually come due, and the force will not be able to deliver.

BUDGET CUTS

Restoring readiness will take a combination of modernization, investment, and remedial effort—and most likely require some level of changing priorities at the Pentagon. The Air Force will require new funds to overcome its shortfalls and may have to withdraw from some missions it can no longer afford.

Defense Secretary Pete Hegseth instructed all the military branches to identify 8 percent cuts to parts of their budgets, with the intent to redirect those savings toward Trump administration priorities including the Golden Dome homeland missile defense project, nuclear modernization, and emerging technologies, such as autonomous systems. Separately, Sen. Roger Wicker, chairman of the Senate Armed Services Committee, has indicated he plans to try to increase defense investment by at least $55 billion annually.

The administration's budget request for fiscal 2026 was still under wraps in March, but Hegseth has indicated he anticipates increased investment in the Air Force, Space Force, and Navy, and analysts indicate the Army is the likely bill-payer for new investments in those service branches.

Allvin said the Air Force is in a good position to appeal for more force structure and stepped-up funding given what it has to offer and the unfunded requirements facing the Air Force.

The Air Force plays crucial roles in homeland defense, nuclear deterrence, traditional deterrence, and, when necessary, combat operations, Allvin said, and those align directly with the administration's priorities. So does modernizing the nation's nuclear arsenal and developing autonomous CCAs.

The Air Force is modernizing its two-thirds share of the nuclear triad—bombers and intercontinental ballistic missiles, and the cost of the new Sentinel ICBM is far exceeding budget. The B–21 bomber, which will be both conventional and nuclear capable, and modernizing nuclear command, control and communications (NC3) are also huge costs to bear, as is the E-4C Survivable Airborne Operations Center. Those three programs were all exempt from Hegseth's 8 percent cuts.

Yet while those programs and missions are clearly in the administration's good graces, that heaps deeper cuts on other areas.

"With an 8 percent cut, you cannot ... take a percentage of this and take a percentage of this," Allvin said in an interview. "We're talking about mission sets that we can't do anymore. We can't say we're going to cut 8 percent and still try and do everything we're doing. ... We have reached that baseline [already], so there will be hard decisions on what the nation wants the Air Force to stop doing."

The Air Force force design is more flexible than other services' future designs, USAF leaders said, because it was "fiscally informed." As Allvin noted, every decision has a trade-off.

Range is a key aspect of the F-47 and B-21; but if the Air Force sacrificed range, it would need to invest more in refueling aircraft that can get closer to the fight.

U.S. Transportation Command boss Gen. Randell Reed recently visited the Omaha, Neb., headquarters of U.S. Strategic Command's Gen. Anthony J. Cotton.

"We got a really deep understanding in terms of how they intend to employ their new aircraft," Reed told the Senate Armed Services Committee recently. "And that will drive a slightly different way in which we are to support them, which actually means that it's going to be a little bit higher requirement specifically in the fuel transfer."

In other words, "more Air Force" will have wide-ranging implications on the other parts of the defense enterprise.

"More Air Force means more of what the nation needs to meet the priorities the President has set, and the Secretary has set," Allvin said.

Yet he also said it's hardly a question of simply asking for more. The goal is to ask for the right additions to be a more effective, more powerful Air Force, one that can attain air superiority when and where it needs to, anyplace on Earth.

That's a fight, Kunkel said, that takes place across the Potomac from the White House, inside the Pentagon. "The Pentagon Wars are about how do we get the money to fund the Air Force that our nation deserves and that our Airmen are privileged to operate," Kunkel said. And how do you win that fight?

"You have to have a coherent narrative, and that coherent narrative has got to be backed up by solid analysis," Kunkel continued. "We've built the narrative, we've done the analysis, we know where it works, we know where it fails, we know how to mitigate those failures."

Now the Air Force is taking that story on the road—to the Secretary of Defense, to the White House, and to Congress.

Space Superiority Takes Center Stage

By Greg Hadley

Looking into the future in 1957, then-Maj. Gen. Bernard A. Schriever predicted that "in the long haul, our safety as a nation may depend upon our achieving 'space superiority.'"

Now, nearly 70 years later, Chief of Space Operations Gen. B. Chance Saltzman is making the case for space superiority in a bold new way, breaking with decades-old tradition and openly talking about destructive force in space.

"The Space Force will do whatever it takes to achieve space superiority," he said at the 2025 AFA Warfare Symposium. He called for the Space Force to invest in every possible way to achieve "space control."

Space Force leaders quickly picked up on his lead, echoing his objective to control the space domain—and to do so with destructive force, when necessary.

"Space control encapsulates the mission areas required to contest and control the space domain, employing kinetic and nonkinetic means to affect adversary capabilities by disruptions and degradation—even destruction if necessary," Saltzman said. "It includes things like orbital warfare, electromagnetic warfare. Its counterspace operations can be employed for both offensive and defensive purposes, at the direction of the combatant commands."

Jud McCrehin/staff

"Space Control" is the newest core function of the Space Force, said Chief of Space Operations Gen. B. Chance Saltzman. Space Control is a tool, he said, with which the Space Force will attain space superiority.

JUST LIKE ANY OTHER SERVICE

Analysts and academics increasingly have noted the need for offensive space weapons and senior Space Force leaders had been more willing to comment on the topic in the recent past. Saltzman, for example, previously referred to "responsible counterspace campaigning," while U.S. Space Command boss Gen. Stephen N. Whiting has said having recourse to "space fires" was among his top priorities.

Yet as recently as September, U.S. Space Force leaders skirted direct references to applying force in space. In March, USSF leaders were more at ease addressing the topic.

Lt. Gen. Douglas A. Schiess, commander of the Space Force component to Space Command, said of Space Force warfighters: "Just like any domain, we need the capabilities to deny, degrade, and disrupt others' capabilities as well."

Maj. Gen. Dennis O. Bythewood, Special Assistant to the Chief of Space Operations, called for "counterspace capabilities that allow us to contest and control the space environment just like any other service would."

Indeed, increasingly open discussion of space superiority extended beyond the Space Force to include Air Force leaders, as well. Air Combat Command boss Gen. Kenneth S. Wilsbach brought up space superiority in a panel about air superiority, endorsing the discussion as part of a holistic approach to joint warfare.

"I'll contend that we should start talking about air superiority together with space superiority as a combo, because you're likely not going to be able to achieve air superiority in the modern sense without space superiority as well," Wilsbach said.

Driving the discussion is the speed with which potential adversaries are advancing in space. Brig. Gen. Anthony J. Mastalir, head of Space Forces Indo-Pacific, said China's deployment of new satellites designed to help target U.S. forces on Earth is a crucial factor in defining emerging U.S. requirements in space.

"The other components, the air domain, the maritime domain, the land domain, depend on the Space Force more than ever to provide that protection ... from space-enabled attack," Mastalir said. "So that's a challenge that we have—all of us have—in terms of establishing that combat credibility, honing that warfighter ethos, and doing so in a way that we can protect those other components as necessary."

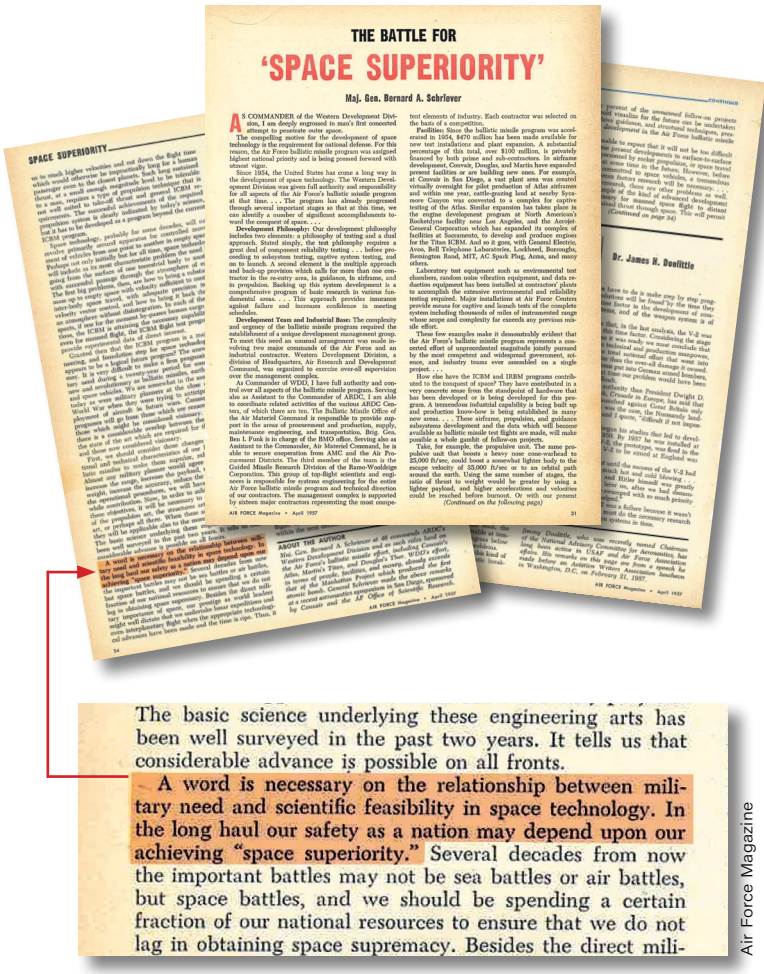
STILL SOME MYSTERY

Yet leaders have not lifted the veil entirely, and the lasting nature of space warfare is the primary reason. The destruction left behind by air, land, and sea battles can be cleaned up in relative short order, while debris created by a space battle will keep whipping around the Earth at 17,000 mph for decades.

Saltzman noted that destruction is ultimately a last choice among the options a commander might choose.

"I am far more enamored by systems that deny, disrupt, degrade," Saltzman said. "I think there's a lot of room to leverage systems focused on those 'D' words, if you will. The destroy word comes at a cost in terms of debris. ... We may get pushed into the corner where we need to execute some of those options."

Schiess agreed that destructive means are essential. "We need



THE BATTLE FOR

'SPACE SUPERIORITY'

Maj. Gen. Bernard A. Schriever

AS COMMANDER of the Western Development Division, I am deeply engrossed in man's first concerted attempt to penetrate outer space.

The compelling motive for the development of space technology is the requirement for national defense. For this reason, the Air Force ballistic missile program was assigned highest national priority and is being pressed forward with utmost vigor.

Since 1954, the United States has come a long way in the development of space technology. The Western Development Division was given full authority and responsibility for all aspects of the Air Force's ballistic missile program at that time. . . . The program has already progressed through several important stages so that at this time, we are silently a number of significant accomplishments toward the conquest of space. . . .

Development Philosophy: Our development philosophy includes two elements: a philosophy of testing and a dual approach. Stated simply, the test philosophy requires a great deal of component reliability testing . . . before proceeding to subsystem testing, captive system testing, and on to launch. A second element is the multiple approach and back-up provision which calls for more than one contractor in the re-entry area, in guidance, in airframe, and in propulsion. Backing up this system development is a comprehensive program of basic research in various fundamental areas . . . This approach provides insurance against failure and increases confidence in meeting schedules.

Development Team and Industrial Base. The complexity and urgency of the ballistic missile program required the establishment of a unique development management group. To meet this need an unusual arrangement was made, involving two major commands of the Air Force and an industrial contractor. Western Development Division, a division of Headquarters, Air Research and Development Command, was organized to exercise over-all supervision over the management complex.

As Commander of WDD, I have full authority and control over all aspects of the ballistic missile program. Serving also as Assistant to the Commander of ARDC, I am able to coordinate related activities of the various ARDC Centers, of which there are ten. The Ballistic Missile Office of the Air Material Command is responsible to provide support in the areas of procurement and production, supply, maintenance engineering, and transportation. Brig. Gen. Ben I. Funk is in charge of the BMO office. Serving also as Assistant to the Commander, Air Materiel Command, he is able to secure cooperation from AMC and the Air Proving Ground Command in the use of current Districts. The third member of the team is the Guided Missile Research Division of the Ramo-Wooldridge Corporation. This group of top-flight scientists and engineers is responsible for systems engineering for the entire Air Force ballistic missile program and technical direction of our contractors. The management complex is supported by sixteen major contractors representing the most competent elements of industry. Each contractor was selected on the basis of a competition.

Facilities: Since the ballistic missile program was accelerated in 1954, $470 million has been made available for new test installations and plant expansion. A substantial percentage of this total, over $100 million, is privately financed by both prime and sub-contractors. In airframe development, Convair, Douglas, and Martin have expanded present facilities or are building new ones. For example, at Convair in San Diego, a vast plant area was created virtually overnight for pilot production of Atlas airframes and within one year, cattle-grazing land at nearby Sycamore Canyon was converted to a complex for captive testing of the Atlas. Similar expansion has taken place in the engine development program at North American's Rocketdyne facility near Los Angeles, and the Aerojet-General Corporation which has expanded its complex of facilities at Sacramento, to develop and produce engines for the Titan ICBM. And so it goes, with General Electric, Avco, Bell Telephone Laboratories, Lockheed, Burroughs, Remington Rand, MIT, AC Spark Plug, Arma, and many others.

Laboratory test equipment such as environmental test chambers, random noise vibration equipment, and data reduction equipment has been installed at contractors' plants to accomplish the extensive environmental and reliability testing required. Major installations at Air Force Centers provide means for captive and launch tests of the complete system including thousands of miles of instrumented range whose scope and complexity far exceeds any previous mission effort.

These few examples make it demonstrably evident that the Air Force's ballistic missile program represents a concerted effort of unprecedented magnitude jointly pursued by the most competent and widespread government, science, and industry teams ever assembled on a single task.

How else have the ICBM and IRBM programs contributed to the conquest of space? They have contributed in a very concrete sense from the standpoint of hardware that has been developed or is being developed for this program. A tremendous industrial capability is being built up and production know-how is being established in many new areas. . . . These airframe, propulsion, and guidance subsystems development and the data which will become available as ballistic missile test flights are made, will make possible a whole gambit of follow-on projects.

Take, for example, the propulsive unit. The same propulsive unit that boosts a heavy one [one-and-one-half] to 25,000 lb/sec, could boost a somewhat lighter body to the escape velocity of 35,000 ft/sec or to an orbital path around the earth. Using the same number of stages, the ratio of thrust to weight would be greater by using a lighter payload, and higher accelerations and velocities could be reached before burnout. Or with our present

(Continued on the following page)

ABOUT THE AUTHOR

Maj. Gen. Bernard A. Schriever is the commander of the Air Force Ballistic Missile Division, Headquarters, Air Research and Development Command, and the Commander of the Western Development Division, which is responsible for the Air Force's ballistic missile program. He is also Assistant to the Commander of the Air Materiel Command, which is responsible for procurement and production of the Atlas, Titan, and Thor missiles. Previously he was Deputy Chief of Staff for Development at Headquarters USAF. He was Commander of the Air Force Ballistic Missile Committee, which produced the first operational ballistic missile, the Thor. While Commander of the Western Development Division, General Schriever made the above remarks in a speech before the Los Angeles Council on World Affairs. His remarks on this subject were also delivered in a recent astronautics symposium in San Diego, sponsored by Convair and the Air Force Association, and in a speech before the Institute of Aeronautical Sciences in Washington, D.C., on February 21, 1957.

The basic science underlying these engineering arts has been well surveyed in the past two years. It tells us that considerable advance is possible on all fronts.

A word is necessary on the relationship between military need and scientific feasibility in space technology. In the long haul our safety as a nation may depend upon our achieving "space superiority." Several decades from now the important battles may not be sea battles or air battles, but space battles, and we should be spending a certain fraction of our national resources to ensure that we do not lag in obtaining space supremacy. Besides the direct mili-

Air Force Magazine

This text, adapted from a speech delivered by then-Maj. Gen. Bernard Schriever, in 1957, may be the first published reference to the necessity to achieve space superiority as a means of deterring or winning future wars.

that capability," he said, "just like any other domain needs that capability. But we have to make sure that we do that responsibly, because the space domain is so important for both commercial and economies, and things like that."

In the past, Saltzman seemed to view counterspace capabilities as either on orbit or terrestrial, and positioned those options in three categories:

- Kinetic, destructive weapons;
- Directed energy weapons, which could impose temporary or lasting damage; or
- Radio frequency energy and jamming systems.

China is pursuing all of these, he said at the conference, without clearly defining what capabilities he has or wants to develop for the Space Force. He acknowledged being "cagey" about what he said.

"The mix of weapons based on the targets is always a military consideration, and when I look at the space-enabled targeting architecture that [China] has built, it's pretty impressive," Saltzman said. "It's in all orbital regimes. It's in the hundreds of satellites. And to give the President options requires a mix of systems to be able to go across the full spectrum of operations to all orbital regimes. There are some things that are purpose-built for low-Earth orbit effects, others in GEO [geosynchronous orbit]. And so the more weapons in the mix we have, the more options we can offer."

The ability to provide different options and potential effects, and to ratchet those up over time to achieve combatant commanders' desired effects is likewise a hallmark of airpower, and was a consistent theme at the conference, echoed by air and space leaders.

The conversation around offensive space had not progressed to the point where Kelly Hammett, head of the Space Rapid Capabilities Office at Kirtland Air Force Base, N.M., was ready to fully open up to reporters on his plans.

But he hinted that it could be trending that way.

"That's an ongoing evolution of the messaging of the Space Force," Hammett said. "The CSO is very forthright in talking about space superiority and the need to improve our game in that arena. He's very publicly talked about it at this event, and that's largely the lane in which Space RCO sits: working to field capabilities for space superiority."

Talking about it, however, is not yet second-nature. "We are, as a department and as a service, working through how can we talk about more of this stuff more publicly," Hammet said.

Retired Gen. Kevin P. Chilton, Explorer Chair at AFA's Mitchell Institute for Aerospace Studies, has argued for more openness, saying there cannot be deterrent value in having offensive capabilities in space if the Space Force isn't allowed to talk about the topic. Adversaries need to understand what the U.S. response could be if and where the red lines might be if they break with norms in space.

British Air Marshal Paul M. Godfrey, the former head of U.K. Space Command and the current Assistant U.S. Chief of Space Operations for Future Concepts and Partnerships, suggested more public disclosure could also help allies thinking more seriously about the need for space superiority in terms of their own defense strategies.

"When it comes to space control, when it comes to protecting and defending, when it comes to space superiority, without understanding what is available, especially from U.S. companies that have been doing this for a long time, we've got to go and invent it ourselves," he said of allies. "And it's going to take money, it's going to take time. And you know, we can shorten that process."

Identifying specific weapons would also help the U.S. articulate areas where it wants partners to invest—an initiative Space Force leaders have described as "allied by design."

THE SPACE FORCE WE NEED

Guardians' increasing willingness to discuss offensive space goes hand-in-hand with leaders getting more and more vocal about the service's need for more resources: a bigger budget, more manpower, and faster funding growth.

Saltzman described space control as the service's "newest core function," noting that "a new mission [requires] new resources."

Building on a metaphor he has used for the past 15 months or so, Saltzman said the evolution of a full-fledged Space Force from the former Air Force Space Command is akin to turning the pre-World War II Merchant Marine into a viable global Navy, or "converting Southwest Airlines into the U.S. Air Force."

Even though the Space Force saw a slight budget cut proposed for fiscal 2025, Saltzman expressed confidence that top Pentagon officials and lawmakers "understand that the Space Force we have is not the Space Force we need."

Getting there will take more than money, he added. "We need to conduct day-to-day operations while we prepare for the high-end fight, "Saltzman said on stage. "Everything we're doing, every new initiative, every project, every task, is designed to get us what we need, where we need to go while threading that needle."

Among those initiatives: the service's new Mission Deltas, a new Officer Training Course, improved Operational Test and Training Infrastructure, new component commands, and the new Space Futures Command that's now taking shape. Creating all that at once puts a "heavy strain" on Guardians, he said, but the impact is worth the effort.

"Other senior leaders will say, 'Hey, the Space Force has so many things going on. We need to catch our breath. Why can't we just slow down, wait a while, consolidate some of our gains?'" Saltzman said. "And I really do wish it was that easy. ... But the answer is, the Space Force we have is still not the Space Force we need."

The Space Force might be able to slow down someday. But in the race to achieve assured space superiority, this is no time to let up on the gas. (Scan **QR code** for Related Reading.)

GOLDEN DOME

Space and Missile Defense Leaders Ponder Golden Dome

By Unshin Lee Harpley

Within a week of his inauguration, President Donald Trump directed the Pentagon to outline a comprehensive air and missile defense strategy with a focus on advanced space-based interceptors. Drawing inspiration from former President Ronald Reagan's Strategic Defense Initiative and Israel's Iron Dome air defense system, Trump dubbed his project Golden Dome with the aim of protecting the U.S. homeland from future missile and airborne threats.

"My focus is on building the most powerful military of the future," Trump said in his address to Congress, calling the Golden Dome missile shield the first step toward realizing that vision.

Building a missile shield over North America, a land mass roughly 1,000 times larger than Israel, will be far more challenging than simply scaling up Israel's Iron Dome. It will require a unified effort across military agencies, including the Space Force,the Missile Defense Agency (MDA), the Air Force, as well as intelligence agencies. It will also involve Congress, the private sector, and most likely allies, along with new technologies.

Air & Space Forces Magazine

Advances in space-based sensors, ground-based radars, and automated tracking will be critical to enabling the Golden Dome missile defense shield, said Lt. Gen. David N. Miller Jr., head of Space Operations Command.

Creating Golden Dome has the "magnitude of the Manhattan Project," said Vice Chief of Space Operations Gen. Michael Guetlein, requiring a "heavy lift" across organizations to be successful.

COLLABORATION AND POLICY HURDLES

Chief of Space Operations Gen. B. Chance Saltzman said the Space Force will play a "central role" in Golden Dome, a frequently repeated point during the AFA Warfare Symposium.

"There are players across the Department of Defense and Intelligence Community (IC) all working on this," said Lt. Gen. Shawn W. Bratton, the Space Force's top officer for strategy, plans, programs, and requirements.

Within the Space Force alone, officials from Space Systems Command, the Space Development Agency, the Space Rapid Capabilities Office, and Space Forces-Space, the service component to U.S. Space Command, all said they have provided input and feedback on Golden Dome.

But which agency will take the lead remains an open question, Guetlein acknowledged. "Our biggest challenge is going to be organization, behavior, and culture," he said. "What we've got to really push back on are the organizational boundaries and the cultures that are going to try to slow us down or to prevent us from working together."

Military bureaucracies are notoriously tribal, and a project of this scale will have to bridge those gaps. Among the agencies vying for a lead role will be the Missile Defense Agency, which dates its lineage back to the Reagan-era Strategic Defense Initiative Organization. MDA director Lt. Gen. Heath Collins said the architecture for Golden Dome has been in

development for decades.

"We're saying, 'Finally, we get another chance to get back at this,'" Collins said. "We think the technologies in space are much different today than they were 20 or 40 years ago, and we're really excited."

Both Guetlein and Collins stressed the need for a unified, single leadership strategy for building Golden Dome. Collins underlined that the agency in charge must be given the authority, resources, and "direct access to senior decision-makers very quickly."

Today's missile defense structure involves multiple entities, each with different priorities and processes, which Collins criticized as a committee-based system that is "very difficult" and "doesn't quite work." He said the layers slow down decisions, noting it can take up to a year just to make an acquisition decision, let alone the years it can take to develop a system.

The Pentagon must also collaborate with the Intelligence Community, including the National Reconnaissance Office, which oversees the nation's spy satellites, the National Geospatial-Intelligence Agency, which provides detailed imagery to track and target missile threats, and the CIA, among others. Disconnects between the military and IC have fueled frustrations for years, but Guetlein said the IC's ability to share information with military units "in a time-relevant manner, and get that data to the shooter, in a manner of time that can actually deter the attack" is crucial for Golden Dome's success.

"We've also got to break down the barriers of Title 10 and Title 50," said Guetlein, a reference to U.S. law governing the military and intelligence agencies, respectively.

"We are not accustomed to having to integrate at the level that's going to be required," Guetlein said. For instance, the Pentagon requires certifications for employees handling IC intelligence but currently lacks a formal certification process for those integrating intelligence into weapons systems. This gap could hinder the timely integration of intelligence into real-time operations.

Guetlein further stressed the need to conduct more testing and training in space to improve the operational capabilities of Golden Dome.

"The authority that we would ask right out of the gate is the authority to do on-orbit training and testing that we're not capable of doing today," said Guetlein. The Space Force is constrained from such testing today. "We would ask that that open up so ... we can increase our readiness of our forces on the front line, to be able to do that 'protect and defend' mission."

"We certainly cannot do Golden Dome the way we've been doing business the last five years or so," said Collins.

TECHNOLOGICAL PUSH FORWARD

The project's success hinges on space-based systems for tracking and intercepting missiles, as these are the most effective means to counter fast, stealthy, and maneuverable threats, such as hypersonic missiles.

"The advancements we've made in space-based sensor layers, ground-based radars, and automated tracking will be critical to meeting this mandate," said Lt. Gen. David N. Miller Jr., head of Space Operations Command.

The military will have to develop an effective kill chain to swiftly identify and track targets, process sensor data, and relay that to launch interceptors, according to Col. Robert Davis, program executive officer of Space Systems Command's space sensing directorate. Israel's Iron Dome will need significant adaptation for the U.S., which is 500 times larger; if the missile shield is to extend to Canada and Alaska, the land mass would double in size once more.

That's to say nothing of other allies, several of whom expressed interest in the concept during the symposium.

"I think there will be huge opportunities for allies and partners to contribute to this," Godfrey said. "And then as a result, we get the benefit of a Golden Dome, which hopefully starts to extend around various areas."

"I imagine there may be a strong need to continue to expand on the work that Space Force is already doing to pivot our architecture to be able to track hypersonic weapons with the LEO and MEO layers," Davis added.

The Space Development Agency ramped up its missile warning effort, creating the Proliferated Warfighter Space Architecture (PWSA), which will include two layers for missile tracking and data transport. By 2029, SDA plans to have more than 450 satellites in orbit, ready to spot and track hypersonic and ballistic missiles, then relay data on them anywhere around the globe.

But "technological gaps" must still be addressed, noted Maj. Gen. Dennis Blythewood, Special Assistant to the Chief of Space Operations. Among the most daunting task is the boost-phase interceptor in space for ballistic and hypersonic missile.

The SDA and MDA tasked contractors with proposing solutions for a space sensor layer and proliferated interceptors for boost-phase intercept. Companies including Lockheed Martin, L3Harris, and General Atomics have submitted proposals, with technology demonstrations set to begin next year and to continue through 2030.

Collins said sensor fusion will be crucial for effective boost-phase intercepts, integrating diverse sensor types into a single, cohesive architecture that can detect and engage targets from all angles.

"Different target types require different types of sensors and different types of sensor suites to provide 360-degree sensor coverage of the [United] States," said Collins. "We need to get the right sensor mix attached in there, we need the right command and control battle management construct, which does not exist today."

Bratton called the complexity of boost-phase interceptors from space "no joke of a physics problem." The boost phase of an intercontinental ballistic missile typically lasts three to four minutes, and the launch may not even be detected until at least 30 seconds have elapsed.

Todd Harrison of the American Enterprise Institute wrote in an analysis that even with SDA's new missile tracking layer, a space-based interceptor would have only about 2½ minutes to strike during this phase.

Hypersonic weapons, which accelerate faster, fly at lower altitudes, and may be somewhat maneuverable, will require an even more challenging interceptor. Harrison said providing global coverage against even a few such missiles could require thousands of interceptors in low-Earth orbit.

While ground-based systems like the Army's THAAD, Patriot, and Ground-based Interceptor (GBI), the Navy's Aegis Ballistic Missile Defense, and the Air Force's AMRAAM air-to-air missile could all have roles in Golden Dome, MDA and the Space Force are exploring new technologies to counter evolving threats.

"Depending on the target, some of these other capabilities, nonkinetics especially, could really help get us after that magazine depth problem that we have," said MDA's Collins, noting that these capabilities could be particularly important when multiple threats arise simultaneously.

For now, the central effort will be organizational and technological, with attention focused on how best to accomplish the mission, including evaluating which existing technologies can be accelerated and what kinds of innovations may be needed. Lt. Gen. Philip A. Garrant, head of Space Systems Command, said that includes "what might be feasible from a physics perspective." His command is trying to understand "what the requirements and the allocation of resources will be."

Congress is already starting its work, even before a budget proposal emerges from the Trump administration. Sens. Dan Sullivan (R-Alaska) and Kevin Cramer (R-N.D.) have introduced legislation to allocate about $19 billion for the new missile defense system in fiscal 2026, most of that earmarked for interceptors to be based at Fort Greely, Alaska, and for THAAD, Patriot, and Aegis investment. Also included is $900 million for space-based missile defense research and development, $500 million for R&D in directed energy for missile interception, and $60 million for space-based satellite sensors development.

MUNITIONS

Sustained Munitions Production and Lower-Cost Designs

Jud McCrehin/Staff

Gen. Kenneth Wilsbach, Commander, Air Combat Command, argued for a mix of exquisite high-end munitions for special targets and a plethora of low-cost weapons that can be expended over a long period of time as a necessary combination to defeat a determined enemy.

By John A. Tirpak

Munitions have long been a bill-payer in the Air Force budget—staples of warfare that, in peacetime, can be neglected or shortchanged to pay for more pressing needs—but after more than two years of war in Ukraine and the Middle East, alarms are ringing across the Air Force on the need to better manage this critical supply.

Air Force and industry leaders at the AFA Warfare Symposium in Aurora, Colo., said it will take effort on both sides to fix the munitions problem. They prescribed clarifying "the demand signal" for munitions needs to industry, establishing predictable, multiyear acquisition programs, investing more in less-costly weapons, and developing more modular weapons designs leveraging open mission systems that are not vendor-locked to a single supplier. They also said the Air Force needs new longer-range munitions.

"We've wargamed a lot … and we know what this highly contested fight [of the future] looks like," said Maj. Gen. Jospeh D. Kunkel, the Air Force's director of force design, integration and wargaming. Then, in a reference to the Russia-Ukraine war, he added: "We see what happens when you run out of weapons … it turns into a meat grinder very quickly, and the side that runs out of weapons loses very fast."

Speaking as part of a panel discussion on air superiority, Kunkel made the case for change. "We need to have the stockpiles, but we also need to be able to build weapons at the rate that we are expending them," he said.

Gen. Kenneth Wilsbach, head of Air Combat Command, said

the Air Force is partly at fault. USAF has "spent a lot of our time in public talking about these very exquisite weapons that are unbelievably expensive," he said. "And we need some of those." But the Air Force also needs mass, he added and is keenly interested in lower-cost weapons that can be manufactured and acquired at scale. More inventory to expend, he explained, "could cause the adversary to run themselves out of weapons."

Finding the right balance of high- and low-end weapons "is the art of what we need to do," Wilsbach said.

It is a national imperative to have "a strategic capacity" to build weapons rapidly and in volume, something not possible today, when lead times for ordering some munitions can stretch out three or even four years.

The Air Force has already begun seeking industry input on producing low-cost cruise missiles in volume. In early March, in concert with the Defense Innovation Unit, the Air Force chose two suppliers—Anduril Industries and Zone 5 Technologies—from among four competitors to proceed as the finalists in the Enterprise Test Vehicle program, which seeks demonstrations of cheap, quick-to-build weapons. Anduril and Zone 5 beat out Integrated Solutions for Systems and Leidos Dynetics in the contest, which is supposed to yield flyable prototypes within seven months. The value of the work was not disclosed.

Weapons production lines around the country are too small and too few to sustain the level of effort needed in a future war, warned Brig. Gen. Robert Lyons, program executive officer (PEO) for weapons and director of the Air Force's Armament Directorate Center.

In a panel discussion on next-generation munitions, Lyons shared three conclusions following visits to weapons factories and their chief executives:

■ **National treasures.** "The production lines in this country that make weapons are national assets, and we've got to make them healthy," he said.

■ **Critical parts.** The nation still needs "exquisite" weapons, such as hypersonic missiles and other long-range weapons, but must at the same time find ways to make weapons "cheaper and differently." He advocated for common components and materials so that parts can be produced in great quantities, providing stockpiles of parts so production can accelerate in the event of war.

■ **New thinking.** "We need to … get to the new ways of building bombs and missiles as fast as we can, leveraging the newest technologies," such as open systems architectures, he said. New weapons should also be "more lethal and more effective" on the battlefield.

Industry panelists said they are already developing modular weapons concepts and have plans for surging capacity if necessary. But companies are skittish about investing in the unknown and, having been burned before, officials said they need to see a committed "demand signal" before building up large-scale production capacity.

In a Feb. 26 House Armed Services Committee hearing, National Defense Industrial Association President and CEO David Norquist suggested the government can't assume capacity will be there when it wants it; if the military wants surge capacity, he said that should be a required part of weapons competitions.

The reality of the bidding process, he said, is that "if you have two bidders, and one bids excess capacity, they will bid a higher price and lose."

Surge needs to be "priced into the contract or treated as an allowable cost," said Norquist, a former deputy secretary of defense. Otherwise, "you're going to get what you asked for."

Frank DeMauro, Northrop Grumman's vice president and general manager for weapon systems, said the Air Force should produce a road map of its weapons needs so industry can anticipate the service's performance requirements and invest appropriately.

Some suppliers in the weapons supply chain are small players, "mom-and-pop" operations that cannot ramp up or down as fast as needed. Planning the munitions acquisition campaign for more than "one year at a time" by means of multiyear acquisition contracts can help those smaller players overcome their limitations.

"If you can get to the point where it's a five-year program with options for one and two years after that," small business can "step up" and "make that investment with confidence knowing they're not going to lose their business when that procurement falls off."

MODULARITY

Jon Norman, RTX vice president for air and space defense systems, said Raytheon's AIM-120 Advanced Medium Range Air-to-Air Missile "has been around a long time," but is getting fresh software and circuitry to allow it to be used by the National Advanced Surface-to-Air Missile System being employed by Ukraine.

That presents opportunities and challenges. "We've got to be thinking about … how are we going to produce it, sustain it, make it modular enough that we are looking at the ability to reuse that weapon [for uses other than] it was originally intended," he said.

Jon Piatt, executive vice president of intelligence, surveillance, and reconnaissance with SNC, said his company is adapting components designed for one application—air-to-air, for example—for use in other weapons. There is value in reusing designs, and successful weapons makers in the future will be those that design for "modularity, upgradeability, alternate uses, the adaptability to other launchers or other platforms," he said.

Norman said that with AMRAAM, "the rocket motors lasted much longer than anyone ever suspected," and the missiles can be adapted with "larger warheads or smaller warheads [to achieve] more … or less collateral damage. Those warheads have been able to be changed out."

The lesson: Older weapons "can be adapted … to provide the ability to expand that production base to meet the full demand of the threat," Norman said. "What we have to do [is] develop the infrastructure and the capacity in the stores that allow us to evolve [the weapons] as that threat evolves."

That can refer to both changing technical requirements and changing volume needs. Flexibility and speed are just as essential. Requirements set three years ago are "archaic," because technology is advancing so quickly. Technical leaps in propulsion and manufacturing technology are taking place daily, but program executive officers are "in handcuffs" having committed to now-obsolete requirements.

Lt. Gen. Dale White, in the air superiority panel, said, "we need to make sure we have a firm grasp on things like rare Earth [metals], minerals, microprocessors, things of that nature, so that we can make sure we have everything we need. The reality is, our supply chain is somewhat fragile."

It's also crucial to "get a firm grasp on where our priorities are" as a joint force, because the military services are effectively competing to acquire products from the same suppliers.

Michael Rothstein, Lockheed Martin Missiles and Fire Control vice president for strategy and requirements, told Air & Space Forces Magazine that Lockheed has anticipated the Air Force's high-low weapons vision and is ready with solutions.

On the high end, Rothstein said, Lockheed offers the stealthy, long-range AGM-158 Joint Air-to-Surface Standoff Missile (JASSM) and its maritime variant, the Long Range Air-to-Surface

Missile (LRASM), weapons that cost $1.5 million apiece. On the lower end, Lockheed plans to offer its Common Multi-Mission Truck (CMMT, or "Comet"), at a fraction of that price, around $150,000.

CMMT won't be stealthy, like the other two, but it will be modular, including an open-mission systems architecture adaptable to numerous missions and able to support a variety of payloads, from a warhead, to a sensor, jammer, or anything else the Air Force wants to put on it. Fuel load and range can similarly be tailored to the mission.

Lockheed has begun testing the CMMT with vertical drops similar to previous Air Force "Rapid Dragon" tests, where pallets of nine JASSMs were dropped out the back end of C-130 and C-17 cargo aircraft. For CMMT, though, the pallet would include 25 missiles.

At 96 inches, the CMMT could fit in an F-35 weapons bay and offer a range up to 1,000 miles, Rothstein said. The modular warhead/sensor/fuel building blocks would be sandwiched between generic front and rear sections. (The range for JASSM extended range and LRASM variants are classified.)

Anduril unveiled its plans for the similar "Barracuda" family of low-cost cruise missiles last September. Rothstein said Lockheed's CMMT concept was not related, and had been in development "for a while now ... we've been listening to the customer for a number of years."

Rothstein envisions employing JASSMs and CMMTs together, just as how the Air Force once operated stealthy F-117 Nighthawks in force packages with nonstealthy F-16s. Just as an enemy sensor homes in on the conventional aircraft to let the stealth weapons fly unimpeded, so an adversary's air defense might pick up the CMMT but miss the JASSM.

The production space for CMMT will probably fit inside a large room and could be picked up and moved to a partner country to get production closer to the action in "Poland, or Australia, or wherever," Rothstein said.

In addition to the JASSM-ER (ER is for Extended Range), Lockheed is also offering the Air Force the JASSM-XR, for "extreme range," whose performance and extra length Rothstein could not quantify due to classification.

The XR, though, would offer the benefit of reducing tanker needs by allowing combat aircraft to launch it much farther from the target.

Kunkel has said on several occasions that the U.S. would be willing to permit partner countries to license designs for local manufacture, reducing the logistical challenge of transporting weapons "7,000 miles away."

Anduril's Enterprise Test Vehicle is intended to be modular, inexpensive and rapidly producible. They are also building their so-called "Arsenal" plant near Columbus, Ohio, which will be geared to building simplified weapons by workers with minimal training. Using a modular design and open mission systems architecture, Anduril wants its Barracuda family of weapons to be easily manufactured and adaptable to the changing threat, Anduril has said.

In a press release coinciding with the Air Force announcement, Anduril said it will produce "a number of Barracuda-500 units" over the next few months, "using manufacturing processes and equipment that are representative of future full-rate production techniques, continuing development toward a production variant capable of rapidly scalable manufacture in 2026."

Zone 5's candidate is the Rusty Dagger, which the company has said is "mature" and has demonstrated palletized and pylon launch, long-duration missions, and high accuracy.

Steve Milano, Anduril's Senior Director of Advanced Effects, said that up to now, the ETV program has been focused on producibility, open systems architecture and integrated subsystems. The next step—which, in the interest of speed, will be executed in about six months—will be to rapidly evolve the design and integrate it with autonomous networks.

Lt. Gen. Linda Hurry, deputy commander of Air Force Materiel Command, said the Air Force has "long-term" contracts in place for weapons like JASSM and LRASM, but not necessarily every weapon.

Multiyear contracts "minimize the cost [and]...we can minimize the response time," she said. AFMC has a "capacity task force" looking at "trying to drive change and break the status quo and think differently about how do you do munitions, what can we do about ... modularity, open architecture and digital material management tools, and assets that we have at our fingertips, and then push the envelope?"

The effort is urgent, she said, because "it takes about two years" to get on contract and start delivering weapons; time that the Air Force cannot afford in wartime.

What the Air Force needs is to regenerate "the health of the shelf," she said. "The good news is, we've got the support of our senior leaders to get after that. In fact, we got a $1.5 billion ask to actually put assets back on the shelf so we can generate the readiness we need and build the capability."

AGILE COMBAT EMPLOYMENT

ACE Gets Real

How USAF is evolving Agile Combat Employment informed by insights from Ukraine and Israel.

By David Roza

As the head of U.S. Air Forces in Europe and Africa and NATO Allied Air Command, Gen. James B. Hecker chats with the commander of the Ukrainian Air Force every few weeks, gaining unique insight into how they're fighting and surviving against Russia using techniques comparable to the evolving U.S. tactic known as Agile Combat Employment, or ACE.

"They've been very successful in not getting their aircraft hit on the ground," Hecker said at the AFA Warfare Symposium in March. "And I asked him, 'How is that? What do you do?' And he goes, 'Well, we never take off and land at the same airfield.'"

The Air Force has promoted ACE for years, hosting large-scale exercises around the world in which Airmen practice working in ever-smaller teams at expeditionary airfields,

Air & Space Forces Association

"I have tons of airfields," says Gen. James Hecker, Commander of U.S. Air Forces Europe-Air Forces Africa. "I can only protect a few of them."

separated from large-scale logistics, maintenance, and other support. Now the war in Ukraine, along with hostilities between Israel and Iran, is providing real-world examples of how ACE might work in a future U.S. conflict, also revealing in some cases how the Air Force concept may come up short.

SO MANY AIRFIELDS, SO LITTLE TIME

For field commanders, Europe is an almost ideal ACE environment. Distances across the continent are comparatively short, there are hundreds of allied airfields available, and allied aircraft can land and take off from almost all of them thanks to the close bonds of the NATO alliance.

Last summer, for example, fighter units from all across NATO gathered at Ramstein Air Base, Germany—not normally a fighter hub—to practice air-to-air combat; Airmen from the 52nd Fighter Wing meanwhile dispersed to a makeshift tent city from their home at Spangdahlem Air Base, Germany, a standard ACE tactic to keep adversaries guessing.

One clear lesson: It doesn't matter how many bases one can disperse to if the bases themselves cannot be protected.

"I've got tons of airfields from tons of allies," Hecker said. "The problem is I can only protect a few of them."

Israel's defense against a salvo of hundreds of missiles and drones in April 2024, while successful, was a highly coordinated defense where the scale of the target set was also very centralized in the state of Israel. But if units spread out in a wider area, defending those bases against attack gets harder.

"We can't have that layered [air defense] for thousands of air bases," Hecker said.

Instead, USAFE will have to pick a few main operating bases to fortify with defensive measures and rapid runway repair teams. From there, aircraft will fan out to smaller air bases to refit and rearm on their way to and from hostile airspace, but they can't stay long.

"Over the last three years of conflict, the targeting cycle on the Russian side has decreased significantly," Hecker said. "So to think you are going to land in another airfield and hang out there for a week with no defense, you're going to get shwacked. … We're not talking weeks anymore. We're talking days, and sometimes we're talking hours, if you want to be survivable."

The head of Air Mobility Command, Gen. John D. Lamontagne, is tracking the same lesson.

"KC-135s have habitually operated out of one fixed location, went forward, done what they need to do at range, come back, regenerate, and do it again on another day," Lamontagne said at the AFA Warfare Symposium. That might not work in a modern conflict. "I think they're going to need to fly multiple times in the same day," he said, touching down at multiple locations.

But moving fast takes practice, especially with foreign partners. Hecker preached interoperability, where Airmen from different countries can quickly refuel and rearm each other's aircraft. Last spring, American and Norwegian F-35 maintainers practiced servicing each other's jets, a crucial allied benefit from having so many NATO partners flying F-35s. Across Europe, where experts expect to see more than 600 F-35s operating in the 2030s, only 10 percent of those will be American.

Beyond training together, true interoperability will require policy changes, Hecker said. For example, last spring, Maj. Gen. Paul D. Moga, commander of the Ramstein-based 3rd Air Force, told Air & Space Forces Magazine that NATO partners continue to wrestle with data security challenges over sharing F-35 mission data files, which gather sensor data on potential threats, geography, and more.

"It's bureaucratic for a reason, because the mission data files are extraordinarily important to the F-35," Moga said. But not all nations are treated equally; Five-Eye partners like the U.S., U.K., Canada, and Australia can share anything, but NATO members and partners all have different levels of access due to intelligence sharing and related agreements that complicate everything from command and control to mission rehearsal and

Putting Airmen Through Their PACES

Meanwhile, building up the skills needed so that Airmen can be effective ACE practitioners is no longer a job just for regional commanders. Air Education and Training Command is injecting new elements into the training pipeline to better prepare Airmen for ACE operations. PACER FORGE, which began in 2022 as a 36-hour exercise at Basic Military Training (BMT), is now expanding to 57 hours. The exercise challenges small teams under stress to overcome obstacles through creativity, flexibility, and teamwork. Extending the exercise by 21 hours will give Airmen "more extensive operational training," said a spokesperson for the 37th Training Wing, which oversees BMT.

Trainees could find themselves building and defending operating locations, recovering high-value assets, retrieving supply drops, and providing tactical combat casualty care. "Instead of being overly prescriptive by [Military Training Instructors], what happens now is, 'Here are the objectives you're set to achieve, here are the resources available to you … you have 57 hours to solve this problem and try to achieve the objective,'" AETC commander Lt. Gen. Brian S. Robinson said at the AFA Warfare Symposium.

"You spent five weeks with what I call 'conform, conform, conform,' and now you're in a place where we want you to understand [that] you need to be able to be agile, flexible, accountable, show initiative, and solve problems," he added.

Similar exercises will follow at specialty technical training, with the intent that, by the time they arrive at their operational unit, newly minted Airmen have already practiced ACE skill sets multiple times. Aircrew students are doing the same thing, recovering and operating out of auxiliary airfields where the logistics support is not so robust.

"It's an exciting time," Robinson said.

That front-end training will help with the ultimate ACE skill: being prepared at any moment.

"Readiness is not just about preparing for the future," PACAF Command Chief Master Sgt. Kathleen McCool said. "It's knowing that anywhere in the globe, at any moment, you could be called to respond."

simulation. "A lot of it is intelligence and information-sharing barriers that we need to get past," Moga said.

Operators, mission planners, policymakers, and even systems architects all have a piece of this complicated puzzle. Overcoming those obstacles could pay off with a fully compatible air fleet.

"What if a four-ship from the Netherlands landed at Lakenheath and one of the pilots got sick?" Hecker asked. "Why shouldn't a U.S. pilot be able to jump in the Netherlands' aircraft and go ahead and take off? We're several years away from that, but that's what we need to strive for."

WATER EVERYWHERE

Where Europe appears to be an ACE haven, the Pacific Ocean region is the opposite. There, the vast distances between airfields make air base defense and logistics support far more challenging.

Hecker said European bases could use fighters and laser-guided rockets to defend against slower-moving cruise missiles and one-way attack drones, like the ones Israel and the U.S. defended against in April 2024. But it's more difficult to defend against ballistic missiles like the ones Israel and U.S. forces defended against six months later, in October 2024.

"I'm more focused on the October attack because I think that probably has the greatest application, or the greatest lessons learned for application in the Indo-Pacific theater," said Pacific Air Forces Commander Gen. Kevin B. Schneider at the AFA Warfare Symposium. "When I look at what the People's Liberation Army is capable of doing, that's the focus."

Ballistic missiles can be defeated with Patriot missiles, ship-based interceptors, and other high-end weapons, but the PACAF boss said the Israeli Air Force's example of how to disperse and continue operations provided a role model of operational flexibility.

"Clearly, the Israelis were prepared. They had trained for that. They recognized and certainly lived every day inside a weapons engagement zone," Schneider said. "They had a plan for dispersal. They had a plan for moving aircraft out. They had a plan for how their Airmen were going to react. They had a plan for how they were going to repair."

Airmen stationed at air bases in Japan, Korea, and Guam should take note, Schneider said, because they all live within China's weapons engagement zone.

"Continued training and continued proficiency in skill sets will allow us to be effective under fire and be able to disaggregate when we need to and then aggregate to take the fight back to the enemy," Schneider said.

PACAF Airmen are practicing those techniques. In August, the 90th Fighter Squadron executed the fastest-ever F-22 deployment, flying combat sorties over the Middle East within 72 hours of their departure from Joint Base Elmendorf-Richardson, Alaska.

"It gave us an opportunity to remind our Airmen that this could happen at any moment," said PACAF Command Chief Master Sgt. Kathleen McCool. "It also gave us an opportunity to work our ACE concepts by sending a small contingent team of F-22s with maintainers and equipment to our partners within the region."

Like in Europe, Airmen in the Pacific need both defended hubs and austere spokes, but airfields in the Pacific are far more spread out and often more austere than their European counterparts. That is a challenge for a service struggling to pay for a long list of modernization programs at once.

"We in the Air Force have to make internal trades, certainly in the Indo-Pacific," Schneider said. "Do we put that dollar toward, you know, fixing the infrastructure at Kadena, or do we put that dollar toward restoring an airfield in Tinian in the second island chain?"

Pacific allies may be able to help. Australia and Japan operate F-35s, while South Korea and Singapore plan to in the future, but even more important than having the same equipment is having a shared understanding.

"We don't all have to have the same kit, but we have to have the same vernacular, we have to have the same or similar tactics, techniques and procedures, and we have to have an ability to communicate," Schneider said. "It puts a big onus on all of us, especially for our command and control systems. We cannot just bolt on this capability."

There may be more chances to practice in the future, as recent U.S. bomber deployments to Australia, combined with Pentagon investments in base infrastructure there, could help establish Australia as a key power projection area.

USAF

Air Force Tech. Sgt. John Chapman's heroism at the Battle of Takur Ghar in Afghanistan on March 4, 2002, earned him a posthumous Medal of Honor, only the 19th awarded to an Airman since the service's founding in 1947.

Battle of Takur Ghar Controversy Continues

New Medal of Honor Museum Plays Down 21st Century Air Force Hero.

By Sean D. Naylor

Twenty-three years after his heroic death on a frozen Afghan peak, John Chapman is still fighting against the odds.

Chapman, a combat controller with the 24th Special Tactics Squadron (STS), died March 4, 2002, fighting al-Qaida fighters on top of Takur Ghar Mountain in eastern Afghanistan after the SEAL Team 6 element to which he was attached mistakenly left him for dead when they retreated at night under heavy fire. Now those events are back in the headlines, this time because of decisions at the National Medal of Honor Museum, which opened March 25 in Arlington, Texas.

Chapman is the only Airman to be awarded the Medal of Honor in the 21st century and his award was not made without its own share of controversy. He was originally awarded an Air Force Cross for his efforts that day, although some reviewers wondered even then if he merited a Medal of Honor. It wasn't until years later that the case was reopened and reviewers used

Wayne Clark

President Donald Trump presents the Medal of Honor to Valerie Nessel, the widow of U.S. Air Force Tech. Sgt. John Chapman, during a ceremony at the White House Aug. 22, 2018.

video from a drone overhead that showed Chapman fighting on, alone—after the SEAL team withdrew. Momentum then built to upgrade the award.

But the SEALs resisted efforts to upgrade Chapman's award. A standoff ensued, broken only after an unusual compromise: Chapman's award would be upgraded, but so would that of now retired Navy Command Master Chief Britt Slabinski, who led the SEALs off Takur Ghar that day and inadvertently left Chapman to fight and die alone. Slabinski believed Chapman was dead when he evacuated the mountain.

Lori Longfritz, Chapman's elder sister, says the Medal of Honor Museum led her to believe for more than a year that he would be among 200 Medal recipients singled out at the museum with a personal exhibit. Then in January, just two months before the museum's opening, she learned that would not in fact be the case. Chapman instead would be included within one of the museum's feature displays, a timeline showing the history of the Medal of Honor, from its creation during the U.S. Civil War to the present. His distinction: His case represented the first use of video evidence to support a Medal of Honor award.

Longfritz might only have been disappointed that her brother would not be among the featured Medal of Honor recipients honored in dedicated exhibits at the museum; but what really rankled her was that while he was not being honored, Slabinski would get star treatment.

Slabinski turned out to be a member of the museum's board of directors. The museum's President and CEO, Chris Cassidy, and two other influential board members were also former SEALs; Slabinski's wife, meanwhile, is employed by the museum as its associate director of recipients and veterans relations. These revelations made the decision to highlight Slabinski at the apparent expense of Chapman more than disappointing.

Courtesy

After his Air Force Cross was upgraded to a Medal of Honor, Chapman, shown here in 2002 in Afghanistan, was posthumously promoted to Master Sergeant.

ROOTED IN CONTROVERSY

The dispute at the Medal of Honor Museum traces its origins to one of the earliest and most controversial battles of the War on Terror, a failed mission during Operation Anaconda in March 2002 in which U.S. and coalition forces sought to encircle and destroy eastern Afghanistan's last remaining mass of al-Qaida fighters. The battle took place in the rugged Shahikot Valley.

Ahead of the first wave of heliborne infantry troops descending on the area, three elite U.S. special operations recon-

U.S. Navy

Then-Senior Chief Special Warfare Operator (SEAL) Britt K. Slabinski, was originally awarded a Navy Cross for his actions while leading a team under heavy enemy fire in an attempt to rescue SEAL teammate Petty Officer 1st Class Neil Roberts during Operation Anaconda in 2002. His award was later upgraded to a Medal of Honor, along with that of Air Force Tech Sgt. John Chapman, who died during the same operation. Slabinksi is shown here in 2002 near Bagram Airfield, Afghanistan.

Mass Communication Specialist 1st Class Raymond Diaz III

President Donald Trump awarded the Medal of Honor to Slabinski, by then a retired Navy Master Chief, in May 2018. The SEALs initially objected to upgrading Chapman's Air Force Cross to a Medal of Honor, but relented in exchange for an upgrade to Slabinski's award.

naissance teams—two from Delta Force and one from SEAL Team 6—had audaciously infiltrated behind enemy lines into the high ground surrounding the valley.

Over several days, the teams used their hidden positions to report on enemy locations and to call in airstrikes, thus helping prevent a battlefield disaster. That success captured the attention of SEAL Team 6 officers at Bagram Air Base, about 100 miles north; Team 6 had seen little action so far in Afghanistan, and they were keen to get their operators into the fight.

Lt. Col. Pete Blaber, a veteran of the Army's Delta Force, had overseen the first three teams' infiltration. But in a decision with fatal consequences, the SEALs cut Blaber out of the communication loop and made plans to insert a small combat element onto Takur Ghar, the 10,469-foot mountain that was the valley's dominant terrain feature.

The eight-man unit, a reconnaissance element called Mako 30, was led by Slabinski, and included six SEALs, an Army signals intelligence specialist, and Chapman. The team's initial plan was to fly to an offset location about 1,300 meters east of the peak and patrol up the slopes in darkness. That way, their night vision goggles and ability to call in airstrikes would give them an advantage should they encounter any enemy.

Then a series of delays out of the SEALs' control set their plans back. Slabinski asked to delay the infiltration 24 hours, but was overruled by his bosses in Bagram. With less time to maneuver under cover of darkness, Slabinski chose to fly straight to the top of the mountain, violating a golden rule: Never land directly on the spot that you intend to make your observation post.

An AC-130 gunship had flown over the peak hours previously and reported it to be unoccupied, but when the twin-rotor MH-47 Chinook helicopter arrived to deliver Mako 30 atop Takur Ghar, they found that intelligence to be faulty. Al-Qaida fighters were dug in, occupying the peak with machine guns, bunkers dug into the mountain, and a tent. As soon as the helicopter arrived, the al-Qaida fighters started firing on the U.S. forces.

An al-Qaida bullet severed a critical hydraulics hose on the helicopter, and chaos began to unfold. In the few seconds that it took for Slabinski to absorb this new reality, he tried to tell the pilots to abort the mission, to get the team out of there.

But as the Chinook lifted off, one of the SEALs, Petty Officer 1st Class Neil Roberts, either jumped or fell out of the aircraft, dropping 10 feet into thick snow; it is possible Roberts mistook the call to pull away as a directive to disembark the helicopter. Unable to turn around, the pilot, a seasoned member of the Army's elite 160th Special Operations Aviation Regiment, steered the stricken helicopter away from the mountaintop as a crew chief hand-pumped cans of hydraulic fluid into the hydraulics system, desperately trying to keep the aircraft airborne. The leak was devastating, however, and the fluid quickly ran dry. The engine failed, and the pilot crash-landed the aircraft at the north end of the valley.

Slabinski, Chapman and the others were desperate to get back to Takur Ghar to rescue Roberts. But with the helicopter too badly damaged to fly, they had to wait. It took 45 minutes for another helicopter to arrive and fly them 8 miles north to the local special ops base at Gardez, where Slabinski, Chapman, and four others boarded a third Chinook for the return trip to the peak.

THE BATTLE UNFOLDS

Arriving back at Takur Ghar, hovering above the mountaintop, the helicopter and its crew endured a withering hail of fire as the six operators jumped into the snow. The would-be rescuers could not have known it just then, but Roberts was already dead, killed by the al-Qaida fighters about half an hour before.

A CIA Predator drone captured video of the scene with its infrared camera. Slabinski can be seen to stumble as he lands in the snow, while Chapman moves immediately uphill to suppress heavy fire coming from a bunker. Closing to a distance of no more than 10 feet, he kills the two militants in the bunker.

Then machine gun fire bursts from another bunker. Chapman returns fire, but is shot and falls to the ground. Slabinski would later say that he glanced at Chapman and took note:

Chapman's rifle was laying on his chest, its aiming laser rising and falling with his breath. He was still alive. Then another member of the team was badly wounded.

Mako 30 was in danger of being wiped out. With no sign of Roberts, Slabinski knew he had to get his men off the mountain. But where was Chapman? Here is where the story gets murky. Slabinski did not respond to an emailed request for comment for this article, but in 2016 he told this reporter, for an article in The New York Times, that as he and the other SEALs edged off the mountaintop, he crawled over Chapman and determined he was dead. The overhead footage does not show Slabinski crawling over anyone, but based on all details available, it appears that the body Slabinski thought was Chapman's was, in fact, the deceased Roberts.

As another of his men was wounded, Slabinski and the rest of Mako 30 retreated off the top of the mountain, taking cover under a rocky overhang. Six hours later, after an arduous movement across a mile of rough terrain, they were picked up by a helicopter.

The CIA Predator, meanwhile, continued to loiter overhead. The intelligence feed proved surprising. Despite Slabinski's initial account that no U.S. forces remained alive there, the Predator camera captured a gunfight on the mountaintop.

There is only one credible explanation for that firefight: That Chapman had actually survived his initial wound and then fought on alone. The video shows Chapman continuing his one-man stand in the heart of an al-Qaida position for about an hour, killing at least one al-Qaida fighter with well-aimed rifle fire and a second in hand-to-hand combat.

Meanwhile, at Bagram, staff officers at the special ops joint operations center were confused. Communications breakdowns meant they were unaware that two helicopters already had been badly shot up trying to land there. As the first of two Chinooks carrying the quick-reaction force [QRF] approached, Chapman came out from cover, exposing his position, to suppress enemy fire. Hours after first being hit, with possible salvation now only seconds away, Chapman was shot once more, this time fatally.

Again a helicopter was badly damaged, setting the stage for a daylong firefight in which five more U.S. troops would die before the Rangers finally wrested control of the peak from the insurgents.

Discussion began almost immediately that Chapman had done something remarkable, surviving his initial wounds and fighting on alone. In the aftermath of the battle, both Chapman (posthumously) and Slabinski were awarded service crosses for their actions. At least some on Chapman's medal review board believed the Airman's valor merited more: a Medal of Honor.

That is where things stood for more than a decade. But in 2016, as part of a larger Defense Department review, then-Air Force Secretary Deborah Lee James initiated a study to determine whether any Air Force awards during the War on Terror deserved to be upgraded to a Medal of Honor. (No Airman had received a Medal of Honor since the Vietnam War.)

Chapman's Air Force Cross was the obvious candidate.

THE PREDATOR AS EYEWITNESS

Requirements for the Medal of Honor are stringent, and until then, eyewitness testimony was necessary. The problem was that no eyewitnesses were on hand as Chapman waged his lonely fight. But there had been witnesses to the Predator feed, and that evidence offered something new: reviewable video of the battle. An Air Force team then combined the Predator footage with video from an AC-130H Spectre gunship, creating a compelling case showing Chapman's exploits. The service argued that the video was the equivalent of eyewitness testimony, perhaps better even, as memory can be fallible, and that by charging the bunker to kill the two militants inside, then fighting alone on the mountaintop, and finally sacrificing his life to protect the inbound Chinook, Chapman more than met the criteria for the Medal of Honor.

Indeed, retired Lt. Col. Dan Schilling, another 24th STS veteran who was the co-author, with Longfritz, of "Alone at Dawn," a biography of Chapman, published his version of the video with his own narration that argues that Chapman's exploits warranted two separate Medals of Honor.

The case for the upgrade ran into pushback almost immediately, however. The SEALs objected to the upgrade, which cast light on their organization's shortcomings during that mission. The Air Force's version of events on Takur Ghar necessarily implied that the SEALs mistakenly left behind a living member of their team, Chapman—a finding the Naval Special Warfare Command was unwilling to accept. Led at the time by Rear Adm. Tim Szymanski, who had been one of the officers in the Bagram joint operations center, the command waged an unprecedented campaign against upgrading Chapman's medal.

After a long and bitter dispute Chapman's Medal of Honor upgrade was allowed to advance, but only if the Pentagon also upgraded Slabinski's Navy Cross. The agreement also split Chapman's citation in two, one part public, the second part classified. This has led to a misunderstanding by some that Chapman earned two awards that day; although, as Schilling points out, the actions, taken separately, each qualified for Medal of Honor recognition, only one medal was awarded.

Each Medal of Honor came separately: President Donald Trump presented Slabinski with his Medal of Honor at a White House ceremony on May 24, 2018. Three months later, on Aug. 22, 2018, at another White House ceremony, Chapman's widow, Valerie Nessel, accepted his Medal of Honor from Trump on what would have been their 26th wedding anniversary. The following day, Chapman was posthumously promoted to master sergeant.

FIGHT FOR RECOGNITION

Since his death, Chapman's loudest champion has been his sister, Lori Longfritz.

When Longfritz found out that a National Medal of Honor Museum was being constructed in Texas, she followed its progress closely. In 2022 an acquaintance arranged for her to be put on the email list for biweekly construction updates from the museum's chief of operations, Darrell Utt. In April 2023, she and other members of her family even held a Zoom meeting with retired Air Force Col. Mike Caldwell, the museum's director of recipient and executive support, at his invitation, to discuss how the exhibits would be displayed.

In December 2023, she suggested to Utt via email that she visit the construction site with one or more representatives of the 24th STS to discuss artifacts that the unit and Chapman's family might make available for a Chapman exhibit. He agreed to set up the meeting, and looped in the museum's curator, Greg Waters. A close reading of the exchanges that follow, which Longfritz shared with Air & Space Forces Magazine, reveals that although no museum official stated that Chapman would have his own exhibit, the museum representatives made no effort to disavow Longfritz of that notion.

An Oct. 5, 2023, contemporaneous email from Longfritz to others in her family indicates that Longfritz understood from

Caldwell that her brother would have his own exhibit. "I just got off a call with Col. Caldwell (Ret.) regarding the museum and the displays," she wrote. "He told me that John's display will be in a different place/building than Slabinski's … Col Caldwell said they haven't quite decided on how each display will be laid out, but did say John's is special since his MoH is the first with video proof. I'm excited to see how they do it."

Six weeks later, in a Dec. 20, 2023, email, Waters indicated interest in acquiring artifacts for display: "I would love to learn more about the artifacts that are potentially available that would help us share the John Chapman story with our future museum visitors." There is no indication that Waters was thinking about a future beyond the 2025 opening of the museum.

Longfritz visited the museum site on Feb. 2, 2024, accompanied by retired Senior Master Sgt. Mike Rizzuto, who had served with Chapman in the 24th STS. "The main reason he was coming is they wanted to be able to offer up any artifacts that the unit had that maybe could be used in the museum," she said.

After touring the site, Longfritz met with a small group of museum officials in a conference room, she told Air & Space Forces Magazine in February 2025. The group included Waters, Caldwell, and Alexandra Rhue, senior vice president for museum engagement and strategic initiatives, she recalled. Again, she concluded the meeting with the firm impression that the museum planned to give Chapman his own exhibit.

"They actually showed us where they were going to most likely put John's exhibit," she said. Waters told her that he and Caldwell would travel to Colorado to meet with Terry Chapman, the mother of Chapman and Longfritz, for whom travel is difficult due to medical issues, according to Longfritz. (In a March 11, 2024, email to Longfritz, Waters wrote, in answer to a query from Longfritz about why her mother hadn't heard from him: "I haven't reached out to your mom yet as I'm waiting to coordinate with Mike Caldwell's schedule.")

During the meeting in the conference room, Longfritz said, she also "called out the elephant in the room," asking whether the museum planned to place her brother's exhibit beside Slabinski's. "They said, 'The exhibits will not be together,'" which Longfritz understood to mean that Chapman and Slabinski would each have their own exhibit. For Longfritz, this was key, because she held Slabinski partially responsible for fighting against Chapman's award upgrade: "I wanted to make damn sure that Slabinski had zero to do with John's exhibit." Museum officials assured her that he would not, she said.

A Feb. 5, 2024, email from Longfritz to Waters, Utt, Rhue and Caldwell expressed surprise at learning that Slabinski had a seat on the museum foundation's board. "How is someone who actively participated in several attempts at squashing another man's Medal of Honor … the man who saved his life and for whom, thankfully, there was video evidence … allowed on the board?" she wrote. "I'm not looking for an answer; it's just a headshaker for me."

In a March 11, 2024, email to Utt, Longfritz inquired whether her earlier comments about Slabinski had upset museum officials. She stated again that she was concerned about any "potential influence on the board" that Slabinski might wield. "John isn't here to ensure his story is correctly and properly told," she wrote. "I am; It's my duty."

Utt's reply sought to set Longfritz's mind at ease. He told her he'd passed her concerns on to Cassidy, the museum president and CEO. "Rest assured, your dedication to ensuring accurate representation is noted and extremely valued," Utt wrote.

Months later, in November 2024, Longfritz discovered that the museum would not mount an exhibit dedicated to her brother. "Somebody reached out to me and said, 'Hey, I spoke to someone within the museum and was told that you were misled on your tour back in February,'" she recalled in the interview.

Longfritz was unsure whether to trust this new information; it seemed so at variance with what museum officials had told her. But on Jan. 6, in an email from Waters to Terry Chapman, the family learned that the museum's only references to John Chapman's heroism would be a photo portrait in the introduction video that visitors see as they enter the museum and "the timeline of the history of the Medal of Honor," which would feature the overhead footage. "We initially thought that we could include a few small artifacts related to his story as well," Waters wrote, "but we later realized that this wasn't possible due to space constraints."

Later that day, Rhue sent a similar email to Longfritz. "Of the over 3,500 Medal of Honor Recipient stories, we are able to feature about 200 in the inaugural exhibit," Rhue wrote. "Through the next few decades, we will be rotating exhibits and expanding on stories. I look forward to sharing more of John's story."

Longfritz asked in follow-up emails whether Slabinski would be among the 200 featured exhibits. Rhue confirmed that he would.

Longfritz was irate. Not only did the SEALs appear to have sought to diminish her brother's heroism, but the museum had apparently knowingly allowed her to believe that John Chapman would have his own exhibit. She had thus spread that word with friends and family and encouraged them to travel to the opening. The museum didn't reveal the facts until directly questioned.

"They told us that there would be an exhibit. … They knew that there was going to be lots of family and friends going, expecting to see a beautiful exhibit for John," Longfritz said. "And only at that point in time, while we're standing there in the museum, was when we would find out that there wasn't one. … They were willing to let my mother, 83 years old and on oxygen, figure out how to get to Texas to see her son in a museum exhibit, only then to find out that there wasn't one. Why? What motivates somebody to do that to a family?"

Air & Space Forces Magazine arranged an interview with Caldwell to ask him about these events, but his bosses at the museum canceled the call and referred the magazine to Seven Letter, a strategic communications firm engaged by the museum. A spokesperson, Amber McDonald, declined to provide a museum official for an interview, instead emailing a statement from Cassidy that had been posted online in January. McDonald was provided a list of questions, but she did not reply.

MUSEUM INSIDER'S ACCOUNT

According to a former official at the museum, there was never any intent to mount a Chapman display.

Although Cassidy's Jan. 31 statement says that the museum did not make its final decisions on exhibits until March 2024, the former museum official who spoke with Air & Space Forces Magazine on condition of anonymity said the decision on Chapman's exhibit had already been made when Caldwell, Rhue, and Waters met with Longfritz in February 2024.

"That decision was made in late 2022/early 2023 … well,

well, well before" Longfritz's visit, the former museum official said. "They placated her, they lied to her, and said, 'Oh yeah, maybe we can get some artifacts,' knowing they were not going to use any of those artifacts."

The December 2018 addition of Slabinski to the museum's board ensured that his version of the Takur Ghar battle would take precedence, according to the former museum official. With Cassidy at the helm and retired SEALs Mike Hayes and Chris Sambar also on the board, the SEAL influence won out.

"There's a connection there," said the former museum official. "It all had to do with keeping Britt [Slabinski] happy."

The board's collective feeling was that giving Chapman an exhibit ran the risk of embarrassing Slabinski, according to the former museum official, who characterized the civilian board members' view of Slabinski and other Medal of Honor recipients as akin to hero worship.

"The people on the board, they eat up the Medal of Honor recipients," the former museum official said. "They weren't going to [give Chapman an exhibit] and take something away from Britt, especially when he does so much for the foundation and his wife works for us."

Yet there was another reason why the board was keen to stay on Slabinski's good side, according to the former museum official. In 2023, Slabinski ran for president of the Congressional Medal of Honor Society, a completely different organization, but one which has its own small museum on the World War II aircraft carrier USS Yorktown at Patriots Point, S.C.

The society did not have a good relationship with the National Medal of Honor Museum under its previous president, retired Army Master Sgt. Leroy Petry, the former museum official said. "They hated us," the official asserted. "We did not get along."

Medal of Honor recipient and Army Lt. Col. Will Swenson was already on both boards, but in 2023 three other Medal of Honor recipients on the National Medal of Honor Museum's board successfully ran for election to the society's board, which stipulates members must have received the Medal of Honor. That meant that four of the museum's five Medal of Honor recipient board members were now on the society's nine-member board, including the president (Slabinski) and vice president (Swenson).

"We knew that he was going to be going up against Leroy Petry at the next Congressional Medal of Honor Society [election]," said the former museum official, adding that leaders at the National Medal of Honor Museum were hoping that if Slabinski won, they would get more access to the society's artifacts. As a result, "there was a lot that went into ... making Britt happy."

After Slabinski's election, "Greg Waters and Alex Rhue went to Patriots Point, S.C., to look at all of their exhibits, to see what was what, what's the value, is there anything that we need," said the former museum official, who did not know whether the trip proved fruitful.

THE FIGHT CONTINUES

Museum leaders understood the challenge but decided on a strategy of "kicking the can down the road" when it came to delivering the hard truth to Chapman's family. Several individuals warned them that they were courting controversy by not giving Chapman his own exhibit, and Cassidy and Rhue were told repeatedly that "there's a lot of sensitivity in the special operations community about this," the former museum official said. But those warnings fell "on deaf ears—over and over and over again," the former museum official added.

In January 2025, the issue exploded into public view. Longfritz voiced her frustrations in a Jan. 9 Facebook post that caught the attention of military-oriented publications and special operations-focused outlets in particular. In his podcast, "The After-Action Report," Seth Hettena called the situation "Stolen Valor at the Medal of Honor Museum." Dave Parke, a former Ranger who co-hosts "The Team House" podcast, launched an online petition that, by early March, had garnered 25,000 signatures.

"We ask the National Medal of Honor Museum to revise their decision to not represent John Chapman's sacrifice and deeds amongst their exhibits," the statement accompanying the petition says. "The Museum's choice to honor Britt Slabinsky [sic] without acknowledging John Chapman appears influenced by politics and seems like an extension of the Naval Special Warfare's efforts to diminish Chapman's contributions."

The blowback caught the museum's executives "flat-footed," said the former museum official. "They were shocked, and I think that's why they were so just deathly quiet initially."

After weeks of criticism, the museum issued its Jan. 31 statement, in which Cassidy stated that the "recipient stories" that the museum chose to highlight "are those for whom we were able to work with family members or other academic institutions to be entrusted with a significant number of artifacts and unique personal items which can be displayed to help bring their story to life."

The statement ignored evidence shared with Air & Space Forces Magazine that makes it clear that both the Chapman family and the 24th STS reached out repeatedly to the museum to discuss what artifacts the museum might want for a Chapman display—but neither the museum nor its communications agency answered our follow-up questions.

Cassidy's defense centers on the museum's timeline feature and its inclusion of a segment of the video that underpinned the upgrade of Chapman's Air Force Cross to the Medal of Honor. "The video ... represents a turning point in the traditional verification criteria for how Medals of Honor are awarded and is part of the Museum's permanent exhibit which will not be subject to our planned regular rotation," Cassidy wrote. "This means Master Sergeant Chapman will remain a featured recipient for the foreseeable future."

But the former museum official said the Chapman video will be only a "very small" piece, one "that's probably going to get overlooked" by many visitors. By contrast, "Britt Slabinski is getting one of the main exhibits, like [notable Army heroes] Audie Murphy and Alvin York [are] getting."

All this controversy was avoidable, the former museum official said: "This is a self-inflicted wound. They didn't think anybody was going to call them out on it, and here they are. They got called out."

Sean D. Naylor *is the author of "Not a Good Day to Die: The Untold Story of Operation Anaconda" and "Relentless Strike: The Secret History of Joint Special Operations Command." He covered Operation Anaconda from the Shahikot Valley for Army Times as an embedded reporter. He now edits and writes for The High Side, an online publication he co-founded with Jack Murphy dedicated to investigative journalism on national security.*

Master Sgt. Nicholas Priest

The Air Force's B-1B Lancers are not only its fastest long-range strike option, but also the bomber with the greatest payload capacity. The Air Force plans to retire the BONE as soon as 2030.

Risking America's Long-Range Strike Capability

Why retiring the B-1 too soon could undermine U.S. security.

By Ross Hobbs

The U.S. Air Force plans to start retiring the B-1 Lancer fleet to make room for the new, sixth-generation B-21 Raider. But the Air Force is planning to do that before the B-21 is combat-ready, a move that threatens America's long-range strike capability and capacity.

The Air Force's future bomber force will be composed of only the B-21 and the 1950s-era B-52 Stratofortress. Although the future of America's bomber fleet may appear secure, there are significant reasons for concern. The early retirement of the combat-proven B-1 is being driven by budgetary decisions, instead of U.S. warfighting needs and sound threat-risk assessments**.** Geopolitical instability is rampant and global bomber demand is at its highest ever, yet the bomber fleet is forecast to dive into instability and shrink before it can grow. The repercussions for U.S. national defense strategy and global power projection could be catastrophic.

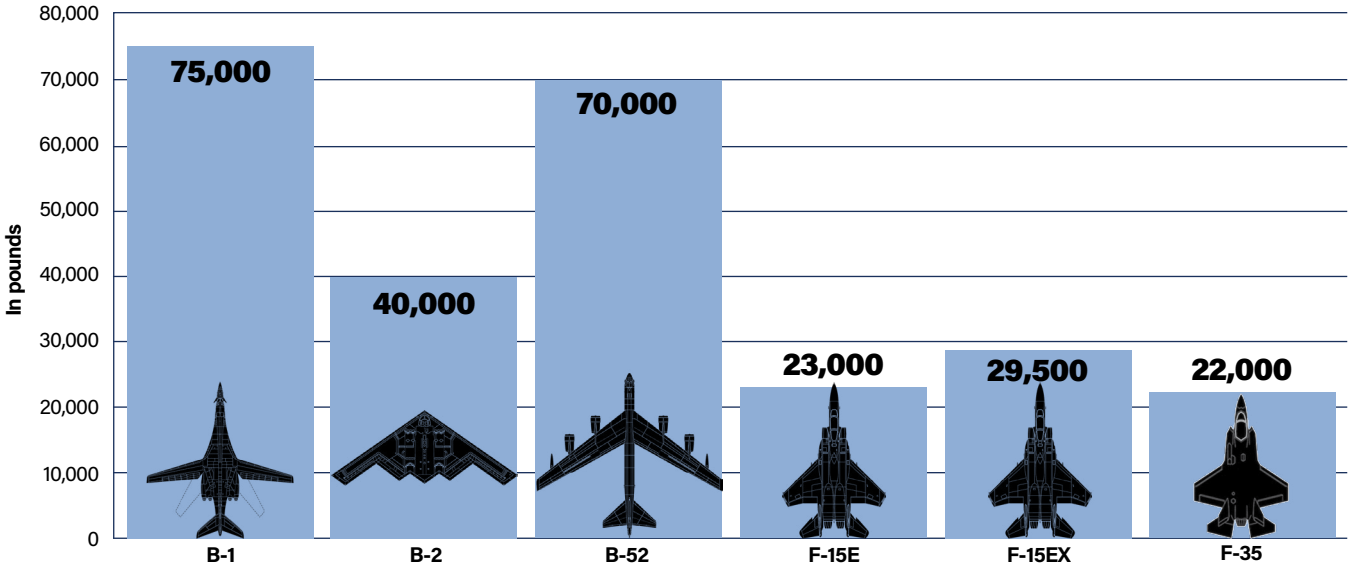
THE CRITICAL VALUE OF LONG-RANGE STRIKE

The phrase, "long-range strike" has been echoed recently by many senior Air Force leaders, specifically within the context of strategic competition with China. As demonstrated by the February 2024 B-1 strikes against Iranian-aligned targets in Iraq and Syria and the October 2024 B-2 Spirit strikes in Yemen, the Department of Defense can use long-range strike to quickly and precisely project global power from the U.S. homeland. These short bursts of power showcased America's ability to secure strategic objectives while also grabbing the attention of every adversary the U.S. lists in its National Defense Strategy. Blared over global media outlets, adversarial nations were immediately reminded of a capability they do not possess, and that the U.S. can use at times and places of its choosing.

In recent years, the Air Force has conducted long-duration Bomber Task Force training missions where bombers, predominantly B-1s and B-52s, execute non-stop flights from the continental U.S. to the Indo-Pacific, Europe, Middle East, or elsewhere, then land back at their home base. With flight durations often over 24 hours, these operations are taxing on the aircrew and base support teams, but they are crucial to forging bonds with allied militaries. Often featuring training integration with U.S. allies and partners, the long-duration missions also serve as strategic deterrence messaging. This reminds potential adversaries to avoid hostile actions that could lead to conflict against the U.S. and its partners. Behind the scenes, these missions are challenging to plan and execute because of the complex coordination required among different U.S. military command levels and partner nations. Despite the challenges and complexities of these

Bombers Carry More

One bomber can carry up to three times the payload of a fighter, but among the U.S. Air Force bomber fleet, the B-1 has the greatest payload capacity.



Source: A&SF Almanac

operations, the Air Force has unequivocally proven its ability and proficiency in long-range strike.

With U.S. forces stationed all over the world, why is long-range strike so necessary? The answer: China, Russia, Iran, and North Korea continue to produce conventional and asymmetric weapon systems designed to keep the overseas U.S. military under threat, especially those U.S. forces in the Indo-Pacific theater. Long-range strike capabilities counter those weapons because they can generate mass combat power from relatively safe locations, often thousands of miles away.

WHY KEEP THE B-1?

Global power projection with long-range bombers is something no other nation can currently execute, and while the B-2 and B-52 are both capable of long-range strike missions, the B-1 "BONE" brings unique value to the Air Force arsenal.

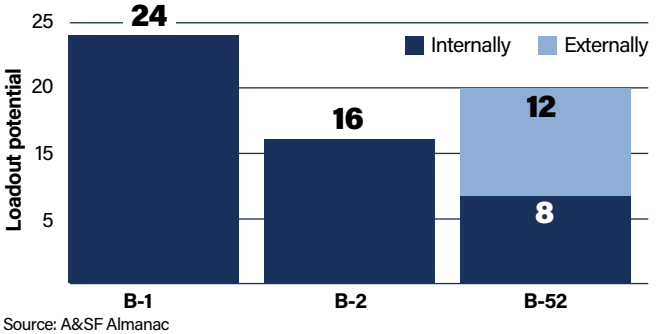
The B-1 has flown over 12,000 combat missions since 2001. As the only supersonic and swing-wing bomber, it also carries the largest payload of precision and nonprecision weapons of any U.S. aircraft. Affectionately known as the "Roving Linebacker" in the Middle East, coalition forces relied heavily upon the B-1's immense weapons payload, range, flexibility, and speed during operations in Afghanistan, Iraq, and Syria. Notably, the B-1 flew only 2 percent of combat missions over Afghanistan, yet was responsible for over 40 percent of precision weapons released on enemy targets; the trend continued over Iraq and Syria during Operation Inherent Resolve. Despite the B-1's unmatched track record with combat operations in the Middle East, the Air Force stopped continuous B-1 rotational deployments, giving the aircraft and personnel the opportunity to recover from the toll of nearly two decades and thousands of flight hours in combat. With concerns over B-1's aircraft structural service life and increasing national focus on the Indo-Pacific, the Air Force directed the B-1's transition into its newest role, strategic deterrence and assurance.

For regional combatant commands, like U.S. European Command and U.S. Indo-Pacific Command, the B-1 has become a mainstay of Bomber Task Force deployments, providing a tangible deterrent effect. The B-1 stands apart from the other bombers, thanks to its basing flexibility, weapon diversity, speed, range, mission set agility, and non-nuclear messaging. With the Pentagon's emphasis on "great power competition" in the European and Indo-Pacific theaters, the B-1 community's focus is aligned to its primary purpose—strategic attack—specifically with standoff weapons.

The B-1 not only has the largest weapon payload of any U.S. aircraft, it is also the Air Force's testbed bomber for hypersonic weapons, making it a supersonic standoff-missile truck ready for future conflicts. Equipped with the Air Force's most exquisite missile, the AGM-158 Joint Air-to-Surface Standoff Missile (JASSM), B-1s are capable of engaging enemy surface targets from over 500 miles away. A B-1 can carry 24 JASSMs per aircraft, and development is underway to allow for future external carry capability for a maximum potential loadout of 36. For context, a single B-1 brings more AGM-158 missiles to a conflict than either a B-2 or B-52, and as many as 12 single-seat fighter aircraft. Notably, the B-1 is the only Air Force aircraft currently capable of carrying the maritime version of the AGM-158, known as the Long-Range Anti-Ship Missile (LRASM). This missile is designed to accurately target enemy combatant ships that create anti-access/area denial

B-1's Superior Loadout

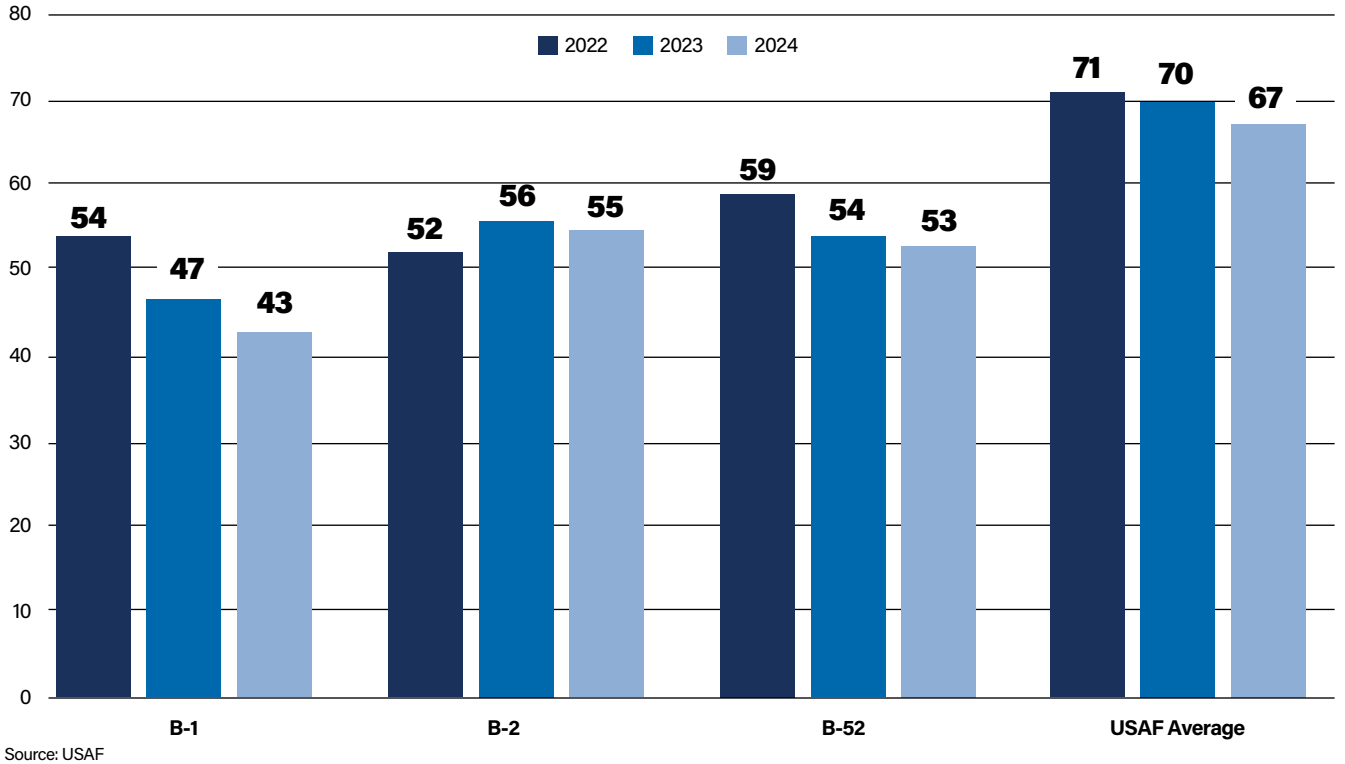
The Joint Air-to-Surface Standoff Missiles (JASSM) is a key U.S. weapon. The B-1 can carry more than any other bomber.



Source: A&SF Almanac

Declining Bomber Readiness

Mission capable rates, which measure the rate at which aircraft are available and capable of performing at least one of their assigned missions, have fallen consistently in recent years. How mission capable rates fared for Air Force Bombers compared to the overall fleet from 2022 to 2024.



Source: USAF

challenges for the U.S. military. With China and Russia expanding their navies, U.S. Indo-Pacific Command and U.S. European Command will need the maritime version of the AGM-158 and the B-1 as key warfighting enablers for any potential conflict in the near-term. Until the other bombers can employ the maritime AGM-158 and also provide the same level of combat effects as the B-1, the U.S. military should be unwilling to surrender the warfighting capability the BONE brings to bear.

A multitude of U.S. allies and partners, especially in the Indo-Pacific theater, rely on the B-1 for strategic messaging, which is foundationally based on its credible combat capability as a non-nuclear bomber. Partner nations clammer at the opportunity to join in with the B-1 on strategic deterrence efforts aimed at China, North Korea, Russia, and Iran. A significant component to U.S. strategic-level messaging with the B-1 is its lack of nuclear weapon capability, directly contrasted to the B-2, B-21 and B-52, which are all nuclear weapon-capable platforms. For many partner nations, especially Japan, one of America's strongest allies in the Pacific, the lack of nuclear capability makes the B-1 a preferred option. But if the B-1 is retired, America's only nonnuclear bomber messaging option will be gone.

Critics of the B-1 often state two major concerns: maintenance and survivability. As the B-1 fleet approaches 40 years old, these are major concerns the Air Force has to confront, but the B-1 is not alone in this discussion.

With the B-52 fleet over 60 years old and the B-2 fleet approaching 30 years old, the Air Force's bombers are all struggling with maintenance issues, mostly driven by supply chain gaps, and current-day relevancy to evolving threats in the 21st century. According to data provided by the Air Force for 2022 to 2024, the B-1's maintenance rate, also known as mission capable (MC) rate, is consistently similar to the B-2 and B-52. Historically, all three bombers have rates lower than the USAF average. In 2022, the B-1's MC rate was higher than the B-2 rate and matched the B-52 rate for 2023. Compared to the rest of the Air Force, the B-1 MC rate for 2023 was higher than the C-130H, C-5M, CV-22, EC-130H, and F-15C. Surprisingly, the B-1 rate for 2023 was only 4 percent lower than the Air Force's newest fighter, the F-35, and in 2024, the B-1 MC rate was reportedly higher than the F-22. Ultimately, the B-1's maintenance generation capabilities are not as terrible as critics often reference, but it is a complex aircraft that does require a lot of maintenance time and cost.

For survivability, the B-1's combination of evolving tactical procedures, ability to fly at supersonic speeds, maneuverability, and recent aircraft upgrades, make the B-1 survivable against the U.S.'s peer and near-peer adversaries. Although the B-1 is not a stealth aircraft like the B-2 or B-21, the B-1 does not need to be. In the opening days of major combat operations, the B-1's most likely weapon employment would be with AGM-158 standoff missiles, released hundreds of miles away from enemy threats, thereby reducing the requirement for stealth.

THE PLAN FOR INSTABILITY

China's President Xi Jinping has declared 2027 the year by which his forces should be "ready" to execute a potential military invasion of Taiwan. That means, the stability of America's bomber force over the next five years is paramount. Yet at a time when the U.S. faces the greatest generational threat to its global security, the bomber force is becoming unstable due to planned retirements of the B-1 and B-2, the introduction of the B-21, and the major overhaul planned for the B-52.

On top of this, the Air Force is also facing an unresolved aircrew retention crisis, funding shortfalls and force structure changes, leading to a future fraught with challenges.

The Air Force's only publicly released timeline for B-1 retirement suggests the aircraft will be retired no later than 2036. But with the rollout of B-21s to Ellsworth Air Force Base, S.D., starting in the mid-2020s and the Air Force's aircrew manning struggles leading to efforts to stay "manning neutral," the divestment of B-1 aircraft could start as soon as 2026. This timeline likely puts B-1 aircraft moving into retirement before B-21 flight-testing is completed at Edwards Air Force Base, Calif., and well before the first B-21 combat squadron is operational. Based on previously seen Air Force practices, it is likely an entire B-1 squadron of 10 aircraft will be inactivated at once, directly cutting the combat-ready B-1 fleet by 30 percent. At the same time, the B-52 will start its biggest upgrade in decades, which the Government Accountability Office (GAO) reports will last until 2035. As the 76 B-52H aircraft go through two major upgrades to their RADAR and engines, fleet availability and mission-generation capabilities are forecast to drop 20 to 25 percent over the next eight years. For several years, the B-2, with a small fleet of 19 aircraft, will be the only stable bomber platform in the inventory.

U.S. Air Force

The B-21 Raider, now going through flight and engineering tests, is not scheduled to arrive in large numbers until after the B-1s are retired.

Global demand for bomber presence and operations has increased significantly over the past 10 years, by one estimate 1,100 percent. During a recent Mitchell Institute interview, Gen. Thomas Bussiere, commander of Air Force Global Strike Command, emphasized this point by saying, "The demand signal for the bombers is greater than any time I've seen in my career, across the fabric of every geographic combatant command." Because of security concerns surrounding the stealthy B-2, B-1 and B-52 squadrons have historically executed most bomber deployments and missions.

With the B-21 likely to require its own special security protocols, the divestment of B-1 aircraft will leave most of these requirements to the B-52, which will either overwhelm an already overtaxed B-52 community or force the Air Force to drastically cut back its global bomber missions. The Air Force's decision to retire the B-1 early shines a spotlight on a troubling disconnect between America's global security requirements and the size of its Air Force in general, and its bomber fleet in particular.

The Air Force plans to purchase at least 100 B-21s, with the goal of operating a total of 175 bombers; the Mitchell Institute, among others, has recommended doubling the B-21 fleet to at least 200, noting that USAF's goal of 175 bombers in 2040 is too little for the requirement. Some Air Force senior leaders now agree that 175 bombers will likely not be enough for a major conflict against China or Russia. For context, the Air Force had 351 bombers in 1990 for Operation Desert Storm and 181 bombers in 2001 for Operation Enduring Freedom. Considering the Air Force's track record for achieving its objectives for new aircraft—such as purchasing only a quarter of its originally planned F-22 fleet—and the slow delays that plagued the F-35 and KC-46 acquisitions, it is reasonable to question the Air Force's ability to match its B-21 delivery objectives.

The Air Force's final number of bombers and exact timeline are contingent upon the B-21 being delivered on time, on cost, and in full. As B-1 aircraft are retired and B-21s are slowly delivered, the Air Force's bomber force will likely experience a "bathtub effect" where a drastic decrease in the total number of bombers occurs before it starts to increase above the current total of 141. This effect will also carry over to aircrew training and combat readiness as they transition from the B-1, B-52, or B-2 to become proficient in B-21 operations. Ultimately, unless actions are taken now to minimize the "bathtub effect," there will be a multi-year decrease in U.S. bomber capacity to respond to aggression from China, Russia, or other adversaries. Delaying B-1 retirements until after the B-21 reaches initial operational capability (IOC) is one way the Air Force can hedge against the risks associated with onboarding of the B-21.

The B-1 and B-21 can operate together. This can be achieved by maintaining the current B-1 fleet at Ellsworth, even as the new B-21s show up and begin flying there. The Air Force's divestiture of 17 B-1s in 2020 and 2021 unintentionally provided a benefit: There is now sufficient room for both the remaining B-1s and the B-21 fleet at Ellsworth. Alternative options include relocating B-1 squadrons from Ellsworth to Mountain Home Air Force Base, Idaho, where B-1s were previously stationed until 2002; or relocating the B-1 squadrons to Dyess Air Force Base, Texas. This would create a single B-1 center of excellence, similar to the B-2 wing at Whiteman Air Force Base, Mo.

A BOMBER IS A BOMBER?

Each U.S. geographic combatant command depends on unique attributes of the B-1 that are at risk of disappearing in the coming years, without a notable replacement. Perhaps, at the core of this disconnect is the misguided generalization that "a bomber is a bomber." Just as the F-22 and F-35, while both fifth-generation fighters, are not fully interchangeable, each bomber brings unique capabilities and mission roles to the fight. The B-1 and B-21 are designed for different missions and roles, and offer different capabilities. While the B-1 lacks the B-21's stealth and advanced warfare attributes, it offers superior speed, payload, and flexibility. The Air Force's plan to swap the older, yet still capable B-1 for the fledgling B-21 will undoubtedly leave U.S. combatant commands scrambling to fill capability gaps.

Bomber Investment Sheds Light on Future Plans

Air Force spending plans indicate declining investment in research, development, testing, and engineering of Air Force bombers, as spending is zeroed out for the B-1 and nearly zeroed for the B-2. Procurement spending, meanwhile, which includes upgrades and new equipment, also declines rapidly for both legacy bombers.

MAJOR USAF PROGRAMS (in $ millions)

	PROGRAM	2023	2024 C.R.	2025 Requested	2026 FYDP	2027 FYDP	2028 FYDP	2029 FYDP
RDT&E	BOMBERS							
	B-1B	19.456	12.619	17.939	1.976	-	-	-
	B-2	100.590	87.623	41.212	0.004	0.004	0.004	0.004
	B-21	3,037.499	2,984.143	2,654.073	2,051.427	1,648.845	1,478.595	1,486.123
	B-52	701.934	950.815	1,045.570	895.365	506.982	473.368	426.807

	PROGRAM	2023	2024 C.R.	2025 Requested	2026 FYDP	2027 FYDP	2028 FYDP	2029 FYDP
Procurement	BOMBERS							
	B-1B	36.313	12.757	13.406	13.154	1.003	1.370	1.397
	B-2	109,244	123,187	79,641	74,917	69,317	33,011	33,671
	B-21	413.165	708.000	721.600	845.000	964.000	1,005.665	1,026.784
	B-52 Mods	70.303	65.815	194.832	267.169	1,092.683	1,047.284	988.289

Source: USAF Budget Data

FOLLOW THE MONEY

As the colloquial phrase goes, "follow the money." With the U.S. military and its programs, words do not matter, allocated funding does. Every year, Congress approves each military service's budget request and within those budgets are specifically allocated funds for different programs. Despite an Air Force senior leader recently announcing that "the B-1 and B-2 fleet retirement will be conditional," the Air Force's budget plan says otherwise. The Air Force's Future Years Defense Program (FYDP) developed for fiscal 2025 to 2029 shows the stark truth that B-1 funding could drastically decline starting as soon as October of this year.

The funding for B-1 research, development, testing, and evaluation will sharply decline by 95 percent starting Oct. 1, 2025 (at the beginning of fiscal 2026) and end outright in fiscal 2027. As it was for the A-10 and other cut programs, such a large drop in funding marks the Air Force's intentional "beginning of the end" for a platform. Additionally, funding support for B-1 weapon system procurement will fall 92 percent at the start of fiscal 2027. These changes in the Air Force's budget, coupled with the Pentagon's proposed force structure changes, strongly indicate B-1 retirements will likely start as soon as 2026.

Defenders of the Air Force's budget decisions may argue "the B-1 is too expensive to operate," but the U.S. GAO's Weapon System Sustainment report shows the B-1's operating costs are hardly unique. The B-2, on top of a per unit cost over $1 billion, is also extremely expensive to operate and sustain. The B-21's future operating and sustainment costs are still unclear, but at $692 million per aircraft (2022 dollars) and the cost of maintaining a stealth aircraft, the future bomber will not be cheap. While the B-1 may be expensive, the alternative—not having the B-1 for a future conflict against a peer or near-peer adversary—is worse. The Air Force would be wise to consider seeing beyond program unit cost and see what matters most—"cost per effect."

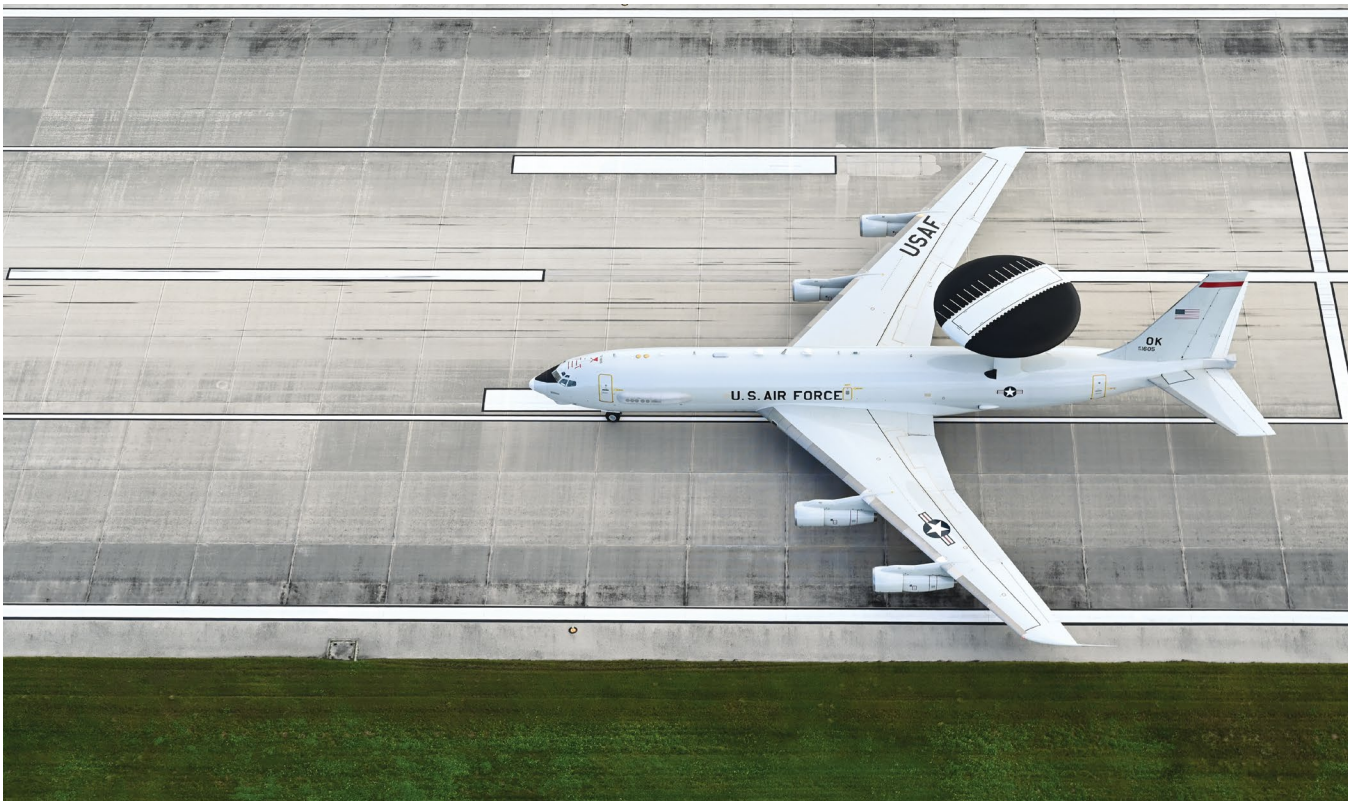
RECOMMENDATIONS

As the U.S. Air Force moves forward with B-1 retirement before the B-21 is ready, the Department of Defense is on the precipice of losing significant long-range strike capability and capacity. This decision will inherently have direct and consequential effects upon America's military and diplomatic ability to respond to global threats. Many of the U.S. combatant command requirements will go unmet, while adversary deterrence and partner nation confidence in the U.S. will decrease during this generation's greatest threat of geopolitical instability. If the Air Force expects to meet U.S. national defense, global security, and combatant command requirements between 2025 and 2035, it should consider the following actions:

- Delay B-1 divestment and retirement until 2035, maintaining bomber fleet stability and U.S. warfighting capacity during a likely unstable geopolitical time.
- Sustain funding for the B-1 at a level that will ensure technological relevancy until 2035, aligning the Future Years Defense Program to America's national security strategy, which requires long-range strike capability.
- Maintain the full B-1 fleet of 45 aircraft until the B-21 has achieved, at a minimum, initial operational capability status—proving combat readiness.
- Conduct an official requirements analysis with the combatant commands to determine what specific capabilities and mission roles the B-1 is expected to provide during a major conflict, with emphasis on roles the B-21 and B-52 cannot perform.
- Fund and deliver solutions from the requirements analysis for the B-21 and B-52, before the B-1 is retired, to ensure U.S. bomber response capability is sustained for all combatant command requirements.

Lt. Col. Ross "RAW" Hobbs *is an Active-duty Air Force officer and Air War College student completing a Senior Developmental Education Fellowship. He is a former B-1 squadron commander, USAF Weapons School graduate, and Joint All-Domain Strategy graduate from Air Command and Staff College. A Command Pilot with over 2,600 flight hours in the B-1 and T-38C, including 466 combat hours, he has deployed five times and completed missions in support of Operation Enduring Freedom, Operation Inherent Resolve, Continuous Bomber Presence, and Bomber Task Force. His work has previously appeared in the Over The Horizon Journal, War on the Rocks, and RAND publications.*

The views expressed here are those of the author and do not necessarily reflect official policy or positions of the Department of the Air Force, or any other part of the U.S. government.



Staff Sgt. Gerald Willis/USAF

The Air Force's shrinking fleet of E-3 Sentry jets, based on the Boeing 707 airliner, will eventually be replaced by the E-7 Wedgetail. Airmen are doing yeoman's work to keep the aging jets flightworthy.

AWACS Enters the Homestretch

As USAF awaits the E-7, Airmen keep the E-3 flying.

By Greg Hadley

TINKER AIR FORCE BASE, Okla.

Observers have called the plane aging, old, even geriatric. A few have described its current state as being in "hospice care," as they look forward to a replacement that is still years away.

Yet on the flight line and in the hangars here, the E-3 Sentry—known to most simply as AWACS, for Airborne Warning and Control System—still cuts an impressive figure, an airframe roughly the size of a KC-46 and sporting its distinctive radome. It's that radome that led one general to proclaim the E-3 "the most significant single tactical improvement since the advent of radar."

There are fewer than ever these days. To keep the fleet alive, the Air Force divested 15 of the aging jets and now maintains just 16 E-3s distributed around the globe, the airframes in the capable hands of a tight-knit collection of Airmen who maintain, fly, and operate the battle management aircraft every day.

"It just really takes miracle workers ... to keep these airplanes in the air."
—Gen. Mark Kelly, former head of Air Combat Command

"We're still needed, the E-3—we're still wanted," an air battle manager standing in the back of an AWACS told Air & Space Forces Magazine this past summer. "The big eye in the sky, people always want that. So yeah, we're not worried about it. Still busy."

KEEP 'EM FLYING

To be sure, the E-3 *is* old. Based on the "jet age" Boeing 707 first launched in the 1950s, today's AWACS fleet entered service in the late 1970s and has been flying for nearly 50 years, much of it in the heat and dust of the Middle East.

The result is a fleet that breaks frequently and demands constant vigilance from maintainers, so much so that Gen. Mark Kelly, former head of Air Combat Command, said in 2022 that "it just really takes miracle workers ... to keep these airplanes in the air."

MIRACLES TAKE TIME, THOUGH

"Just to get one generated and get in the air, we work about 16 hours—just to prep the aircraft," a maintainer said. "It's not that the aircraft may be broken, that's just

the inspections ... we do really diligent inspections. As the airframe gets older and older, the more we inspect and the harder we inspect. We start getting further into bigger components and making sure that we can safely fly the jet."

Corrosion is a top concern. Every 18 months, teams perform isochronal inspections—essentially a "mini-depot," the maintainer said.

Inside, the E-3 combines analog and digital components. Its varied sensors, miles of wire, and communications systems require a maintenance team of Airmen with 11 different Air Force Specialty Codes (AFSCs), three to four times the norm for other USAF airframes.

"When you have 11 AFSCs, and then you have multiple parts that integrate with each AFSC ... at some point they have to mesh with each other. So, I may have availability of an avionics person to go troubleshoot this job, but I may not have a computer guy to go assist them," he said. "That's where it gets kind of janky when it gets to the maintenance side, is we have to integrate almost everybody."

On top of that challenge, the small number of aircraft left in the fleet and the growing number of hours needed for repairs means that maintenance and operations must strike a delicate balance, one that requires daily communication said Col. Jason Zemler, commander of the 552nd Operations Group.

"When I was a captain ... if you stepped on one jet and it wasn't available, you went to the next jet, you went down the line, you would see a picture of a bunch of E-3s," Zemler said. "Now, if you step to one and it's not available, chances are high you're having a long conversation with maintenance to really kind of understand the challenges with that jet and that airframe."

Any change in the flying or maintenance schedule for one aircraft has a ripple effect on the others, said Col. James Combs, deputy commander of the 552nd Air Control Wing (ACW).

With such an old aircraft, replacements can be hard to find when components break; 707 production stopped more than three decades ago and parts suppliers have begun winding down production lines.

One logistics superintendent said sourcing spare parts requires her team to canvass contractors and scavenge the "Boneyard," where retired aircraft can be cannibalized for hard-to-find parts.

"My job is just pushing the button saying, 'Hey, where's it at? We have aircraft that have got to fly,'" she said. "I'm the annoying mosquito."

Not surprisingly, then, the E-3 is hardly a daily flyer. In 2024, the fleet's mission capable rate—the rate at which aircraft are able to perform at least one of their assigned missions—was just 55.7 percent. That means that fewer than nine E-3s are available on any given day. That's enough for peacetime, but would be a challenge in war.

"Our maintainers are able to maintain an aircraft availability rate commensurate with the level of training that we can maintain, in order to maintain the crews that we need, in order to respond to our global force management requirements," he said.

Yet that's not bad for a plane, Combs said, "that doesn't have parts made for it anymore, that's been used to the capacity that the E-3 has been used."

NOT SURVIVABLE

As valuable as the E-3 remains for orchestrating air assets and monitoring a battlespace, the E-3 is not fit for combat in a peer conflict.

Today's AWACS is "not survivable in a future fight, so it doesn't bring us the capability we need," said then-Deputy Assistant Secretary for Budget Maj. Gen. James D. Peccia III, in

Master Sgt. Natasha Stannard/USAF

Years ago, if E-3 systems couldn't operate or an aircraft couldn't fly, other jets were standing by, AWACS veterans recall. Now there are rarely fallback options.

Airman 1st Class Josey Blades/USAF

E-7A Wedgetails, already flown by the Royal Australian Air Force, will eventually replace the E-3 Sentries. The RAAF has been hosting and training USAF aircrew as part of an exchange program to prepare Air Force members to take on the new platform beginning in about 2027.

2022. The E-3, added then-Air Force Secretary Frank Kendall is "essentially not effective in the environments we're most worried about."

The Air Force has a rush plan in effect to acquire the E-7 Wedgetail as a replacement; based on the 737 airframe, with updated engines and a new multirole electronically scanned array (MESA) sensor, the Wedgetail will provide better, more consistent coverage and require fewer personnel.

The first E-7 is not scheduled to be delivered until 2027. In the meantime, USAF aircrew are learning to operate the aircraft with the Australian Air Force which already has the jets.

E-3 AWACS aircraft are stationed at Kadena Air Base, Japan, and Joint Base Elmendorf-Richardson, Alaska, as well as here, but the early cuts focused on Tinker and the 552nd Air Control Wing. Their aircraft started heading to the Boneyard at Davis-Monthan Air Force Base, Ariz., in March 2023, and over the next six months, 12 more followed. In 2024, two more left—15 aircraft gone in the span of a year and a half.

Lt. Col. Grant Georgulis, former commander of the 965th Airborne Air Control Squadron and now a fellow with AFA's Mitchell Institute for Aerospace Studies, said the drastic reduction posed logistics and morale challenges.

"You got rid of the iron very quickly, but we still had all of the humans associated with that iron," he recalled. "And so now you have a problem with being able to maintain currencies for a bunch of aircrew that no longer have the associated iron that allows them to maintain that training proficiency."

Maintaining proficiency for pilots, air battle managers, and sensor operators even as the fleet shrunk was essential to retain knowledge and balance individual and USAF needs.

"We can't really look at the divestment of the E-7 and the investment of the E-7 as two separate events," Combs said.

"What we're trying to do in this wing is to weave that together ... to avoid as much of that brain drain as possible, while also balancing a need for the Airmen to continue to develop professionally."

In the early going, Georgulis said, it was a struggle to get enough sorties for everyone while still giving maintainers the time they needed to keep the jets healthy. But as Airmen started rotating out to their next duty stations, the crunch to find everyone flying time eased.

"We used to operate with about 280 to 300 people per squadron," Zemler said. "We've gone down to about 120 per squadron right now, so relatively smaller."

That doesn't mean all that talent has been jettisoned. Wing leadership is working on long-term plans to ensure manning is there when the E-7 arrives.

"We can look at PCS (permanent change of station) cycles, and we're really trying to forecast, i.e., I may want to actually let somebody PCS now, so that they can go do a three-year time on station somewhere else, and then I can bring them back when we're onboarding to E-7," Combs said.

Still, as the wing shed personnel and aircraft, leaders worried about talent retention and how Airmen would react.

"To be frank, [2023] was a little tough," Zemler said. "When you watch airframes fly away to the Boneyard, it's a pretty insightful moment when you actually visibly see less airframes on the flight line. So [2023], I would say it was pretty eye-opening. But I think we've kind of come far from that now to really see, 'This is where we were at. This is where we put our focus.'"

Airmen left behind inevitably feel they are being asked to do more with less.

"We're trying to really get in front of recognizing our Airmen for all the good stuff they do, pointing out that when times come up where it's very busy, it's easy to maybe look past something," he said. "But even though you're busy and you're tired, and you still do the right thing, we get them the recognition, and we make sure that that's public recognition."

STILL GOING

The Wedgetail successor is every bit as a visually striking as the E-3. The Royal Australian Air Force (RAAF), which operates the E-7, regularly hosts American Airmen in an exchange program to teach them about the new platform. The RAAF has brought the Wedgetail to exercises such as Red Flag, and senior USAF leaders have flown on it.

But Georgulis had a simple way to ground anyone in his unit getting dreamy-eyed thinking about the future.

"Hey, this jet [the E-3] is going to be flying for next 10 years," he said. That's not a long time for some old-timers, but for young Airmen it's half a life. "'What were y'all doing 10 years ago? You were in high school,'" Georgulis said he tells young Airmen who might get dreamy eyed about the coming E-7. "So think about that like you have another 10 years before we have to really start thinking about it."

For now, the Air Force still rarely conducts a large-scale exercise without an E-3 to command and control fighters, deconflict airspace, and more. So far in 2025, AWACS have popped up everywhere from Greenland to Guam.

And while the Air Force is investing in new ground-based command and control equipment and hopes to move some of its targeting mission to satellites, leaders say airborne C-2 remains critical for its range and flexibility.

That means training and operations are still just as urgent—and intense—as ever for the dozen or so crew members on each E-3 flight.

"As soon as the computer is ready to go and it's turned on, we're setting up our scope, making it look how it needs to," an air battle manager said. "The sensor operators are checking out their systems, making sure they're optimized, making sure it's ready to go. Because as soon as the fighters say, 'Fight's on,' that means that it's go time. We're in the mission. ... It's intense. There are things always happening. You're checking in, making sure that people are being safe, that fighters aren't running into each other or going out of the airspace. And when the fight is happening, you're providing the new information they need, keeping things up to date. It's never like sit back and just observe."

On the ground, a new flight simulator helps operators hone their skills without burning expensive flight hours. The new sim is a "big pod up on hydraulic stilts," providing full-motion realism so pilots can drill on emergency procedures and aerial refueling.

Actual flight hours are still critical, though, and the wing's maintenance and operations groups work together, Combs said, to build "some very creative scheduling processes."

"When I came in, there were a bunch of old heads that didn't want to change," the maintainer said. "Then we became more innovative with how ... we can make a troubleshooting process easier, faster, stuff like that. If we don't give these guys the freedom to think on their own and come up with these ideas, we will never get these aircraft off the ground."

VALUE ADDED

Given the E-3's age and shrinking fleet size, it's hardly surprising that wing leaders say the Air Force has become more judicious in how it deploys and uses the AWACS. With years still

Airman 1st Class Brianna Vetro/USAF

The modern interior and consoles in the E-7A Wedgetail are a stark contrast to the interior on the E-3. U.S. Air Force officers training on the on-board mission console in 2024 included (l-r) Capt. Joseph Gonzalez, Maj. Christopher Dunn, along with Royal Australian Air Force Flying Officer Veronica Nicolich.

to go before E-7, they want to preserve what life the remaining aircraft have without overtaxing the iron or the humans who work on it.

Yet within the proud AWACS community, there's a sense that the aircraft has plenty of useful life left.

"We keep evolving the equipment," said one airborne data system technician. "We keep pressing forward and adding what we need to add to our jet to make sure that we're capable at any given moment."

Old-school technology that once recorded data on tapes are now gone. "The first version that I flew in was not a Windows based system," Zemler recalled, harkening back to the early 2000s. "You used to have to type codes and lines in there in order to get one of the three colors you were going to have on the display."

Now the interface is like that of a laptop or home computer, said the technician: "It runs just as fast and just as clean, and it's just as user-friendly."

The AWACS cockpit has likewise been overhauled, upgraded with new digital multifunction displays, featuring "a moving map display for us on one side, and a lot more control and situational awareness on what we're doing, where we're going," explained an AWACS pilot said. "Everything being digital now goes through the analog converters to a digital display and shows us just a lot more of what's going on. It's more modern compared to the old steam gauges."

The connections between analog and digital systems can be difficult to keep up and the hydraulic controls require a level of precision on the part of pilots that fly-by-wire systems don't need, but Airmen describe an affection for the Sentry that runs deep, formed over hours of studying, chatting, and playing UNO while en route to mission locations deep into the night. Said one engineer of the workspace: "It's the best office you can have, tons of great views from 30,000 feet."

Airman 1st Class Melany Bermudez/USAF

Maintenance on the E-3 is constant at the 961st Aircraft Maintenance Unit at Kadena Air Base, Japan.

"I love AWACS," the maintainer said. "This AWACS community has been my home for 15 years, so I can't speak for other airframes, but I don't think I would ever want to go to another one, with just how family and tight-knit the 552nd ACW is completely."

And it's getting even more tight-knit as the community shrinks.

"I truly believe, if we were asked to go to combat tomorrow, the Air Force or the joint staff would still ask for [AWACs]," Zemler said. "And that's not chest pounding. ... We really put in a lot of effort with our maintainers and our ops individuals to stay on the leading edge as much as possible, to be there at the moment of need."

Senior Airman Julia Lebens/USAF

The Air Force E-3 Sentry's Airborne Warning and Control System systems evolved over time. The first versions required codes to operate, while the current version runs on the Windows operating system. "We keep evolving the equipment" said one systems technician. "We keep ... adding what we need to make sure we're capable at any given moment."

Staff Sgt. Nichole Sanchez

Preserving fighter missions at Air National Guard wings is one key way to build capacity and retain pilot experience in our combat air forces, the author argues. The Air National Guard's 142nd Fighter Wing recently transitioned to the F-15EX from F-15Cs.

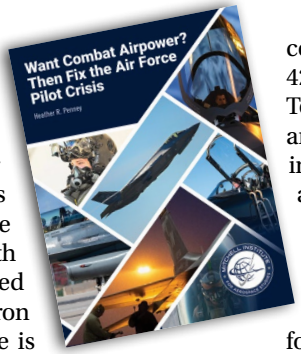
Fixing the Air Force Pilot Crisis

Combat airpower requires more planes and more pilots to fly them.

By Heather Penney

The U.S. Air Force is stretched thin by unrelenting rotational and contingency response demands, and its chronic pilot shortage just won't go away. For more than a decade, the Air Force has fallen short of its pilot goals by about 2,000—the number was about 1,850 pilots in 2024—and with aging combat aircraft inventories, more planned force structure divestments, and projected squadron closures complicating the problem, the service is now struggling to ensure its pilots have the experience needed to succeed in combat. The Air Force no longer has the depth of forces—neither aircraft nor pilots—needed to withstand combat losses and sustain effective combat operations at the scale, scope, and speed necessary to prevail against a peer adversary.

Growing the Air Force's corps of seasoned pilots who can survive and be mission-effective in a highly contested battlespace is crucial to being able to successfully employ air combat capabilities across the range of conflict in any theater around the globe. That will require not only new pilots, but the ability to retain those already trained and skilled.



Heather Penney is a former F-16 fighter pilot and is a Senior Resident Fellow at AFA's Mitchell Institute for Aerospace Studies. Download the entire report at *http://MitchellAerospacePower.org*

During the Cold War, when the United States last confronted a peer adversary, the Air Force possessed 422 bomber and well over 4,000 fighter aircraft. Today, with a more complex array of peer threats around the globe, the U.S. Air Force's combat aircraft inventory is the smallest in its history: 142 bombers and just over 2,000 fighter aircraft. The bomber fleet averages nearly 50 years of age; the fighters, about 30. Age correlates with readiness, as planes need more maintenance as they get older, reducing their availability. In fiscal 2024, mission-capable rates for bombers were just over 50 percent; for fighters, mission capable rates—which measure an aircraft's readiness to perform at least one of its assigned missions—ranged from 40 percent for F-22s to 64 percent for F-16s. Overall, mission capable rates for fighters averaged less than 58 percent.

With so many combat aircraft well past their service design life, and most lacking the stealth and other attributes and capabilities necessary for peer-level conflicts, America faces a crisis in airpower.

To reverse the downward spiral, meet current peacetime rotational and training demands and be ready to fight and prevail in a complex and protracted peer conflict, the Air Force must recapitalize and grow its

shrinking fleet. It must also grow the pilot corps while retaining experienced pilots—maintaining the right ratios in squadrons and adding strategic depth across the Total Force.

Growing force structure will naturally stress the existing pilot corps. It takes years to build an experienced combat pilot, and the Air Force may not have the time to produce, train, and season new replacement pilots at the pace of need. The Air Force must carefully preserve as much experience as possible in its pilot corps across the Total Force or risk further collapsing the Air Force's combat readiness. Pilots increasingly voice their frustrations from serving as high-demand, low-density assets. Their continual high operating tempo is driving more and more Air Force pilots to leave the service.

The Active Component (AC) alone cannot meet the service's mission requirements. The Guard and Reserve are key to retaining and growing a corps of experienced combat pilots to credibly dissuade, deter, compel, and prevail against a peer threat. The Air Force and Congress must commit to the Total Force modernization, growth, and recapitalization necessary to field the force of combat aircraft and experienced combat aviators needed for a high-end fight with a peer competitor. Addressing force size, pilot absorption, and experienced pilot requirements are key to rebuilding a force that wins.

THE EXPERIENCE IMPERATIVE

Warfighter experience is essential to prevailing against adversaries—it is often the critical differentiator that can tip operational outcomes in favor of America's forces in peer conflict, an intangible that cannot be replaced by artificial intelligence (AI) or drones. The term "pilot experience" captures the difficult-to-quantify elements of airmanship, wisdom, judgment, and intuition that can make the difference between winning and losing.

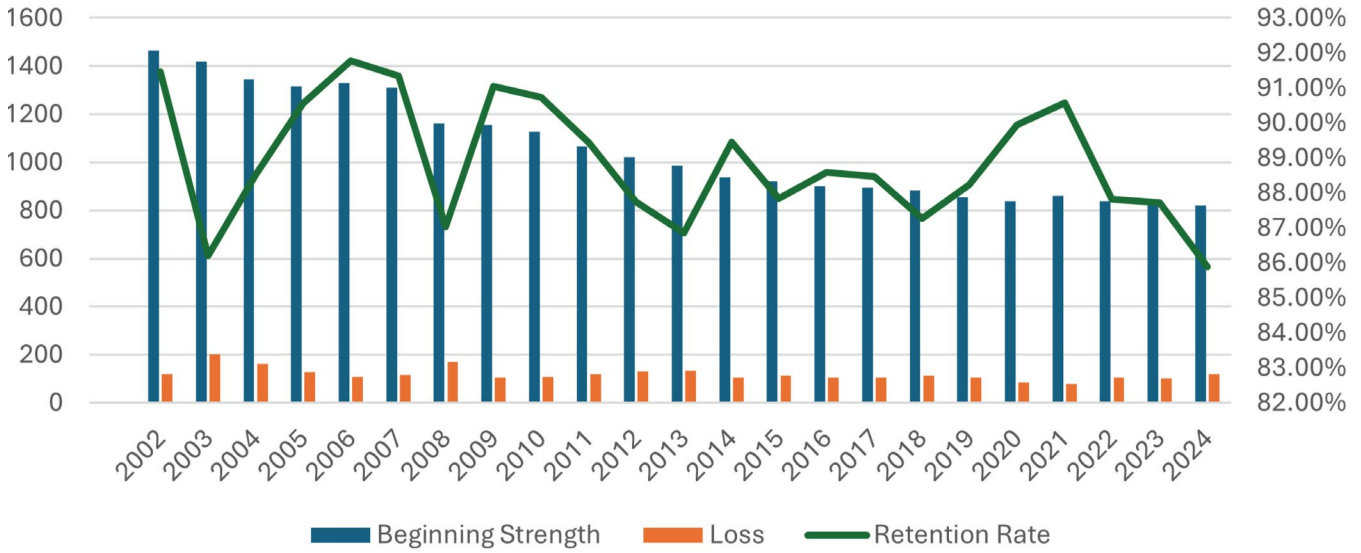
While this experience can be tricky to measure with precision, the evidence of it is not: starting from the World War I, experienced combat pilots have demonstrated superior mission outcomes and lower attrition rates compared to inexperienced pilots. While the introduction of aviation to the Western Front in Europe quickly demonstrated the value of military aviation, the value of experience emerged just as fast. But only by flying at the front could pilots develop the airmanship and judgment needed to survive. New pilots were exceptionally vulnerable their first few sorties, and it took time flying at the front to develop the airmanship and judgment needed to survive. As Allied pilots were lost in combat, replacements arrived with fewer and fewer hours of flight time. By the end of the war, an Allied replacement pilot had a life expectancy of just three weeks once they began combat operations. Some were dead within three days.

In World War II, pilot skill and experience proved even more essential. Moreover, the conflict demonstrated that combat pilot corps must also have sufficient strategic depth or risk collapsing in a protracted conflict. Germany and Japan had skillfully trained their fighter pilots before the war, and they were arguably the best in the world. But the Axis nations were overly optimistic about how long the war would last. Both lacked depth in their pilot corps, and their training pipelines proved insufficient to replace combat losses. Without a sufficient reserve of experienced pilots, a robust training infrastructure and pipeline, or the time to season their pilots, the Luftwaffe and Japanese air forces collapsed under the pressure of U.S. and Allied combat air operations. At the end of WWII, Germany was producing fighters at a rate faster than prewar, but it did not have the pilots to fly and effectively employ them, ceding air superiority completely to the Allies. Japan's combat pilot corps was similarly devastated, and Japan had little choice but to adopt kamikaze tactics, in which inexperienced pilots were trained to use their aircraft as human-guided missiles.

In contrast, the United States entered World War II with a small and not particularly skilled or experienced pilot corps. Yet the U.S. Army Air Forces (USAAF) and the U.S. Navy benefited from the nation's rapid mobilization for total war, drawing on the latent capacity of the U.S. civil aviation industry to contract quality pilot training even as they scaled production to expand their pilot corps while replacing pilots lost to combat operations. The number of pilots the United States was able to graduate on a monthly basis during WWII was great enough to prevent its forces from falling into the attrition-experience

Air National Guard Fighter Pilot Retention

The Air National Guard pilot population has declined gradually since 2002, but retention remains robust, at an average of 89 percent. The Air Force did not provide retention rates for Active-duty fighter pilots.



Mitchell Institute

death spiral that hollowed out the German and Japanese air forces.

Even though training timelines were compressed, U.S. pilots still received 140 hours of flight instruction, enough to impart airmanship, skill, and the initial level of judgment necessary to be prepared for combat. Moreover, the scale of pilot production enabled the USAAF to rotate pilots to nonflying duties or even back to the United States. It became clear that a combat air force must have sufficient experienced pilots to offset combat attrition, provide a reserve of experienced pilots to sustain high-intensity combat operations, and simultaneously surge pilot production. These lessons are relevant today since WWII was the last time the United States fought at a global scale and scope.

THE STRATEGIC DEPTH IMPERATIVE

While some might imagine a shrinking aircraft inventory would reduce the pilot crisis, the opposite is true. Fewer cockpits mean fewer sorties, which translates into less pilot training capacity. Divesting aircraft also disrupts the shape of the Air Force's pilot corps. Crew manning is tied to force structure, and when aircraft fleets are downsized, their pilots must either be retrained or depart the service, and pilot production reduced. In the mid-1990s, as the Air Force drawdown got underway following the fall of the Soviet Union and the Warsaw Pact, the Air Force used all of these approaches, which had the unforeseen consequence of distorting the service's pilot corps and creating large gaps in pilot experience. The Air Force's pilot shortage has since only worsened instead of resolving itself—even as the service has continued to shrink its combat aircraft inventories.

The U.S. Air Force must take aggressive action to solve its combat pilot shortfall, but it is not enough to simply produce new pilots at the same rate as seasoned pilots leave during peacetime; the U.S. Air Force must also develop and **experience** new pilots at the same or greater rate as its losses, especially knowing wartime attrition will drive far higher backfill demands. Because pilots must first fulfill a 10-year Active Duty Service Commitment (ADSC) before they are eligible to exit the service, the pilots leaving are often highly experienced with advanced qualifications as instructor and evaluator pilots.

To grow its combat aircraft inventory and meet required crew ratios, the Air Force must train more than one new pilot for every new aircraft—typically 1.25 pilots per aircraft. Importantly, these additional pilots cannot all be newly trained pilots. As aircraft inventory is added, squadrons must stand up with the appropriate leadership, instructor pilots, evaluator pilots, flight leads, and other supervisors to ensure safe and effective flight operations. Without enough experienced pilots in squadrons, new pilots will not receive the training or supervision needed to become experienced instructors and evaluators themselves at the pace the service needs. Experienced pilots are also crucial across the Air Force enterprise, where their wisdom, leadership, and operational expertise are essential to everything from developing technical requirements and policy guidance to strategy and operational planning. This means that pilot production alone cannot solve the Air Force's force structure challenges. The Air Force must retain its experienced pilots across the Total Force to field the strategic depth the nation needs.

CCA CAN COMPLIMENT HUMAN COMBAT PILOTS

Today, the Air Force is aggressively pursuing collaborative combat aircraft (CCA) to boost its combat capacity and fill its combat aircraft shortfalls. These autonomous drones may indeed improve the Air Force's operational effectiveness by expanding a fighter's sensor and missile ranges, providing electronic warfare support, acting as communications relays, and otherwise enhancing mission performance. Yet CCA cannot replace human fighter pilots in contested battlespaces because of the fundamental limitations of autonomous technologies. Software engineers unanimously agree that the ability for AI to approach, let alone exceed, a human pilot is still a long way off.

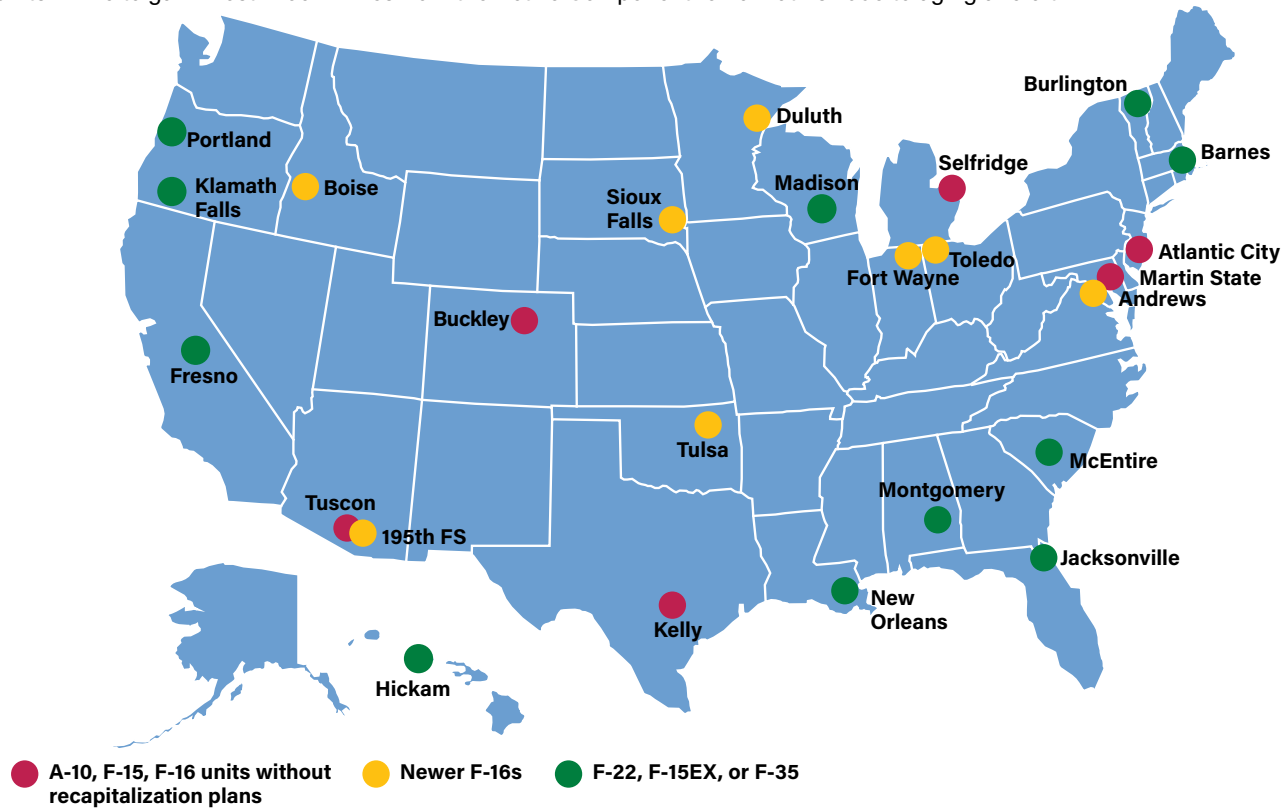
Humans can borrow and apply experiences and insights from seemingly unrelated fields and topics, innovate in relevant ways in real time, take the initiative even when disconnected from external command and control resources, and make decisions in highly uncertain operational conditions. The Air Force should develop CCA and explore their full potential,

Staff Sgt. Jacob Hancock

The Florida Air National Guard's 125th Fighter Wing in Jacksonville, Fla., got its first fifth-generation F-35 fighter in March, the beginning of a transition that will ensure operational relevance for years to come. Many other Guard fighter wings are flying aging jets that put the units at risk of losing their missions.

Air Guard Fighter Squadrons at Risk

The Air National Guard has 25 fighter squadrons, of which at least half are at risk of losing their fighter missions. Squadrons at Martin State Air National Guard Base, Md., and Selfridge Air National Guard Base, Mich., are losing their fighter missions, while units in line to gain "Post-Block" F-16s from the Active Component remain at risk due to aging aircraft.



Source: Mitchell Institute, data provided by the Director's Action Group, Air National Guard, October–November 2024.

Mitchell Institute

but they do not negate the need for the proven, reliable, and resilient combat outcomes that only combat pilots can provide. The Air Force must do more to build the strategic depth of combat pilots the nation needs.

THE AIR FORCE'S RESERVE COMPONENT

Many qualified, experienced pilots who exit the Air Force's Active Component choose to continue to serve in the Air National Guard or Air Force Reserve, which together make up the Reserve Component (RC), which boasts a pilot retention rate far greater than that of its Active Component. While the Active Component currently holds a steady retention rate of 45 percent, the Air National Guard has retained an average of 89 percent of its pilots for over 20 years. A robust Reserve Component can ensure that investments made to train and develop mature pilots are retained in the Total Force.

The Reserve Component's pilot corps predominantly comes from pilots exiting the Active Component at the end of their ADSC, meaning that the Reserve Component has higher percentages of experienced pilots than the Active Component. Many pilots who leave the Active Component seek to join the Guard or Reserve, both of which offer more stability and the opportunity to continue to fly and serve. When coupled with the RC's retention rate, the strategic depth the Guard and Reserve offer the nation should not be undervalued. The Air Force must acknowledge this reality as it postures to be ready to deter or win a peer conflict.

To further harness this opportunity, the Air Force should increase the number of jets assigned to its Reserve Component fighter squadrons. Reserve Component fighter wing commanders routinely report they must turn away qualified pilots who are exiting the Active Component. These AC pilots clearly want to continue to serve and fly, and growing capacity in the Reserve Component is the only realistic means for ensuring they can do so. Most of the Air Force's Active Component fighter squadrons have 24 combat-coded aircraft, while its RC fighter units are assigned 18 aircraft. Increasing these RC squadrons to 24 assigned jets would create seven to eight more pilot positions per squadron. These additional aircraft would need associated maintenance support and spares to ensure squadrons can fly them at required rates, but the benefit of retaining more experienced combat pilots would greatly outweigh the costs of these additional resources.

The Air Force's Active Component must grow to meet operational demands for airpower, and concurrently increasing the service's RC would help maintain experienced pilots in the force that the Active Component has already developed but cannot fully retain. Taking full advantage of the Reserve Component can greatly reduce the impact of rebuilding a Total Force that is capable of deterring and, if necessary, defeating aggression by a peer adversary. But fighter squadrons in the Reserve Component are at risk of divestiture if they are not rapidly recapitalized with new aircraft, meaning that there might not be anywhere for pilots exiting the Active Component to continue to serve.

TOTAL FORCE CHALLENGE

The aging air fleet is worse in the Reserve Component, where F-15Cs, A-10s, and early-block F-16s are among the most likely to be divested. As aircraft recapitalization programs have been

A 104th Fighter Wing F-15C Eagle taking off at Barnes Air National Guard Base, Westfield, Mass., represents one of the older aircraft in the Air National Guard inventory.

Airman 1st Class Elijah Harris

terminated, deferred, and slow rolled, the convention of sending older equipment from the AC as it is modernized to the RC is no longer tenable, placing the Reserve Component in distress. Without one-for-one replacement in the near term, divesting more existing aircraft threaten to reduce combat capacity and experienced fighter pilots in Guard and Reserve units.

Indeed, the Air Force plans to inactivate or "re-mission" 13 fighter units across the Total Force. The Reserve Component is at the highest risk of suffering from these types of mission changes. Fleet age is a major factor in these force structure decisions, especially for units with combat aircraft that are at or beyond their planned service life, have structural deficiencies and rapidly growing sustainment costs, and are increasingly difficult to maintain and modernize. While some RC squadrons will recapitalize with new F-35As, many RC fighter squadrons are without a plan to replace their legacy iron.

Shuttering fighter squadrons in the RC will further stress the Active Component, which is already too small. Meanwhile, retiring RC squadrons and divesting their combat capacity will make it harder for the Guard and Reserve to attract and capture those experienced pilots completing their Active Duty Service Commitment.

The U.S. Air Force must recapitalize and modernize its forces as it reoptimizes for great power competition and conflict. As it does so, it should adopt approaches that maintain a robust, experienced corps of combat pilots across its Total Force. Continuing to divest the Reserve Component's fighter forces will eliminate opportunities to capture pilots departing the AC and retain them in the service—the Air Force cannot afford to lose these pilots entirely. Increasing the Air Force's long-term pilot absorption capacity and retaining those pilots over their flying life cycle will require recapitalizing and growing the size of its RC and AC concurrently. Recapitalizing and growing both components is the best approach for optimizing the service's combat pilot experience across the Total Force.

RECOMMENDATIONS

The U.S. Air Force has been studying its pilot absorption and life cycle dynamics for over two decades. Today, the service has better data and models that it can use to understand its pilot ecosystem, but these tools have yet to produce solutions to many of its problems. There comes a point where studies alone will not fix the problem. It takes investment. The Air Force's pilot shortage has grown even as it cut the size of its forces, increased its pilot retention bonuses, and decreased its pilot staff requirements by opening those positions to its ground specialties, civilians, and contractors. These death spiral patterns must be arrested and reversed.

Decades of chronic underfunding have left the Air Force undersized in comparison to its mission. As Chief of Staff of the Air Force Gen. David Allvin has said, "The nation needs more Air Force." The Air Force must now grow its combat forces to solve its pilot crisis, and do so in a way that preserves a cadre of experienced pilots. The service should use its pilot life-cycle modeling capabilities to better understand potential unintended consequences and benefits of recapitalizing, modernizing, and growing its force structure. The Air Force should also seek ways to increase the elasticity of its pilot production enterprise to meet changing demand, even if it means reopening pilot training bases. Most importantly, it must grow the size of its Reserve Component combat forces together with its Active Component combat air inventories—it cannot neglect one in favor of the other. The Guard and Reserve are linchpins to resolving the Air Force's pilot shortfalls because its combat squadrons capture many of the experienced pilots that choose to leave the Active Component. To this end, the Mitchell Institute offers the following recommendations:

1. Grow the Active Component fighter forces to increase the quantity and rate at which it can absorb new pilots and maintain pilot combat readiness. More aircraft would develop the experience new fighter pilots require at a rate that equals or exceeds the pace that its experienced pilots exit the service, while also providing more monthly training sorties for all pilots. Growing the Air Force's combat aircraft inventory would also decrease the frequency and duration of pilot rotational deployments that have a marked impact on pilot retention.

■ **Replace old aircraft with new at a one-for-one rate.** The Air Force's "divest to invest" strategy for recapitalizing its aging forces is a failure; USAF must immediately stabilize its force size by replacing aircraft at a one-for-one rate. Doing so will also stabilize the Air Force's fighter pilot corps.

■ **Increase the Air Force's F-35A acquisition rate.** The F-35A is the U.S. Air Force's primary fighter program, yet procurement rates continue to fall far below the program of record—and, more importantly, USAF's need. The Air Force should procure 74 F-35s per year to recapitalize and modernize its Total Force combat squadrons.

2. Grow the number of Reserve Component fighter squadrons and increase the number of fighters assigned to each. Capturing and retaining experienced fighter pilots who exit the Active Component is the most efficient and least disruptive way to increase the number of experienced combat pilots in the Total Force.

■ **Grow the number of Reserve Component fighter squadrons.** Many Reserve Component wings have a single fighter squadron. The U.S. Air Force could cost-effectively grow the number of fighter squadrons in its Reserve Component by taking advantage of unused ramp space and infrastructure at bases that host Active Component wings. Collocating new squadrons in wings with seasoned squadrons that are equipped with similar type aircraft would also help facilitate training the new unit's pilots and other personnel.

■ **Grow the number of primary assigned aircraft at Reserve Component fighter squadrons.** Most Reserve Component wings with a fighter mission have a single squadron of 18 primary aircraft. Increasing the number of primary assigned aircraft in these units to match the number of aircraft in Active Component squadrons would gracefully grow the Total Force's combat capacity and pilot corps with fewer adverse effects.

■ **Leverage Reserve Component pilot experience to absorb Active Component pilots.** As the U.S. Air Force grows its Reserve Component, it should use some of that additional capacity to help absorb new AC pilots graduating from their initial fighter qualification courses. The Air Force has previously used the Reserve Component in this way, but its effectiveness faltered as the RC's aircraft aged.

3. Recapitalize and modernize combat forces to improve mission-capable rates. If boosting production of the F-35A alone cannot alone arrest inventory declines and improve mission-capable rates, acquiring advanced F-16 models to replace legacy airframes and grow the inventory should be considered. While neither the F-15EX nor new-build F-16s offer the full combat utility and survivability of 5th-generation fighters, they do offer other benefits, such as easing unit transitions and mitigating the downtime that comes with converting 4th-gen squadrons to fly the 5th-gen F-35A.

■ **Procure the F-15EX and advanced versions of the F-16 to triage legacy aircraft availability and prevent squadron closures.** Replacing current F-15Cs and F-15Es with the F-15EX and replacing F-16s with an advanced version of the F-16 would modernize the Air Force's fighter squadrons with minimal operational downtime. These aircraft are mature and will achieve high mission-capable rates, while experienced F-15 and F-16 pilots can convert easily to fly the new jets, retaining their experience in the Total Force.

■ **Fully fund weapon system sustainment accounts, fully man all maintenance billets, and increase aircraft maintenance depot throughput.** The Air Force must fully fund and resource the weapon system sustainment accounts—to include aircraft spare parts, and maintenance personnel—of all its aircraft if it is to achieve the mission-capable rates necessary to absorb and maintain the readiness of its Total Force. Of course, the optimal way to decrease the staggering weapons system sustainment costs of maintaining aging aircraft is to replace them as rapidly as possible.

4. Recapitalize and modernize the Active and Reserve Components concurrently. To fully integrate the Reserve Component into all its operations, the Air Force should avoid segregating the Active and Reserve Components. Ensuring concurrency supports the interdependencies and efficiencies between the two components that increase their flexibility in peacetime and wartime.

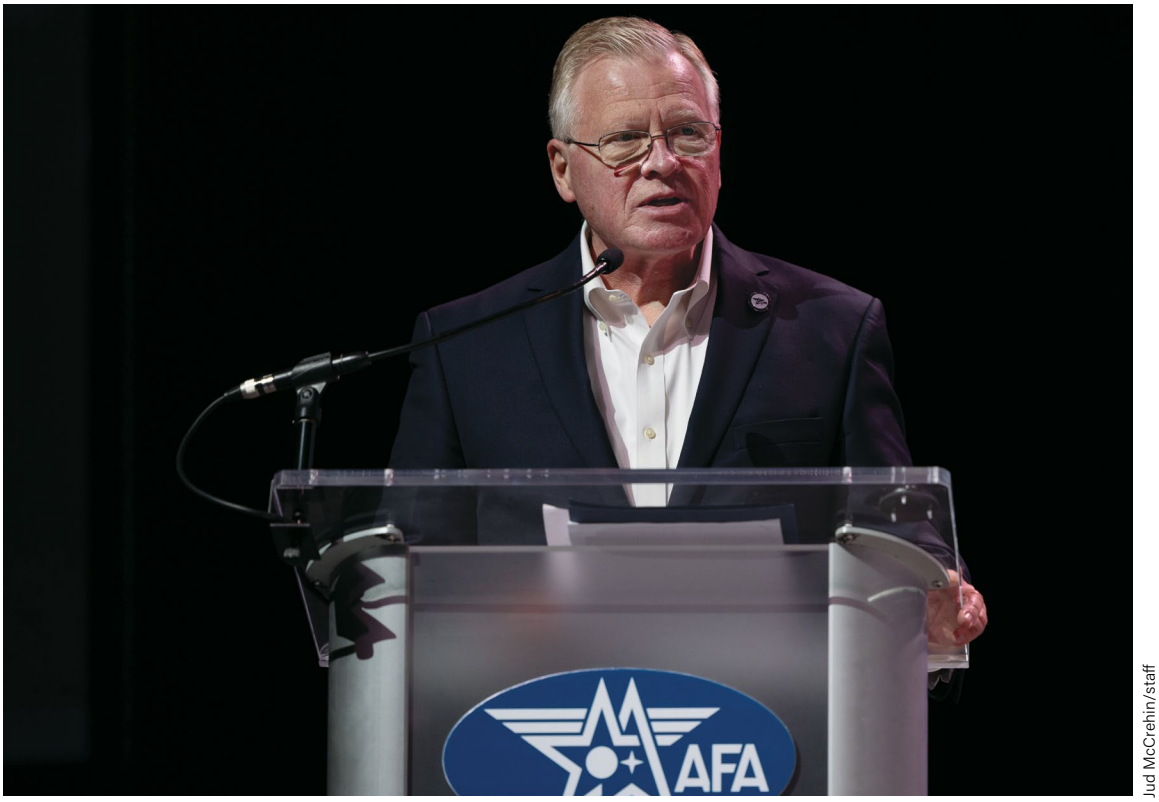
Ultimately, the U.S. Air Force must build and maintain an experienced combat pilot corps that has the strategic depth to meet the nation's global security needs. The Air Force today is too small to do this now, which is the true root cause of its persistent pilot shortfall crisis. Growing the size of the Air Force and modernizing its forces—especially its Reserve Component's combat squadrons—is the only viable, cost-effective means to resolve this shortfall and increase the retention of experienced combat pilots across the Total Force.

Master Sgt. Jerilyn Quintanilla/USAF

Late model F-16s that may be transitioned out of the Active-duty force could be directed to Air National Guard Wings at risk of losing their fighter missions, preserving combat capacity in the Guard component.

By Patrick Reardon

AFA Elevates Maj. Gen. Larry Stutzriem to Executive Vice President



Jud McCrehin/staff

After nearly seven years helping to build and expand AFA's Mitchell Institute for Aerospace Studies, Stutzriem is moving to a new executive role at AFA where he will apply that and his Air Force experience to strengthening the Association.

ARLINGTON, VA.

Maj. Gen. Larry Stutzriem, USAF (Ret.), has been promoted to Executive Vice President of the Air & Space Forces Association.

Stutzriem was previously Director of Research at AFA's Mitchell Institute for Aerospace Studies, where he has held senior roles since 2018. As Executive Vice President, he becomes AFA's second-in-command and de facto chief operating officer.

"Stutz has a rich history of leadership within AFA and the U.S. Air Force," said Lt. Gen. Burt Field, USAF (Ret.), AFA's President & CEO, in announcing Stutzriem's selection. "His experience running research at Mitchell for the past seven years has given him deep and unique insight into AFA's operations, and his research and Air Force experience means he knows better than most the immense challenges facing our Air Force and Space Force today. I can't think of a better choice to help AFA better educate the public, advocate for, and support our Airmen, Guardians, and their Families."

Stutzriem is a recognized expert in national security strategy, airpower, and organizational leadership, and he is a staunch advocate for the nation's warfighters and their families. He was commissioned through Air Force ROTC at Arizona State University, where he earned a Bachelor of Science in Civil Engineering, and later earned a Master of Science in Aviation Management from Embry-Riddle Aeronautical University and a Master of National Security Strategy from the National Defense University.

Over a 30-year career, he flew the F-4, F-16, and A-10 aircraft, as well as the T-37 and T-38 as both instructor and commander. Stutzriem helped direct air operations in Afghanistan following 9/11, resulting in the surrender of the Taliban government in 90 days. While in Afghanistan, he led the team that pioneered time-sensitive targeting that underpins today's high-value targeting concepts. During nation-building operations in Iraq, he was assigned to the U.S. Department of State to reinvigorate the political-military interface. His final assignment was as Director of Strategy, Plans, and Policy for U.S. Northern Command and North American Aerospace Defense Command (NORAD). There, he led a dynamic team that achieved historic breakthroughs in theater security cooperation in the Western Hemisphere and the first Arctic defense strategy.

Stutzriem was awarded the Bronze Star Medal during Operation Enduring Freedom and received the State Department's top service award. He replaces Maj. Gen. Doug Raaberg, USAF (Ret.), who retired from AFA in December after five years with the Association.

"I'm honored to be selected for this position, and I will dedicate my efforts to the unmatched warfighters of the Space Force and Air Force. I look forward to the privilege of helping guide this Association and its 120,000-plus members to ensure our nation has an unrivaled Air Force and Space Force that can decisively fight and win, anywhere anytime," Stutzriem said.

By Lyndsey Akers

Building Community, Strengthening Voices: The ENGAGE@AFA MilSpouse Summit

Against the backdrop of the AFA Warfare Symposium in Denver, the Air & Space Forces Association's United Forces & Families (F2) program hosted the "ENGAGE@AFA: MilSpouse Summit" on March 5. This first-of-its-kind gathering was designed to elevate the voices of military spouses and highlight their indispensable role in the defense community. Held at the Gaylord Rockies Resort & Convention Center, the summit brought together dozens of military spouses, service members, and community leaders for a half-day event of candid conversation, collaboration, and networking.

Under the theme of "United Through Community," the heart of the event was a shared mission: to strengthen military families by fostering meaningful connections and providing actionable insights to help them navigate the unique challenges of military life. The program featured an impressive lineup of speakers who delivered thought-provoking discussions and personal stories that resonated deeply with attendees.

Jud McCrehin/Staff

Dr. Jason Womack, a Space Force leadership strategist, author, and speaker, delivers the keynote speech at the "ENGAGE@AFA: MilSpouse Summit" during the AFA Warfare Symposium in Denver.

"Consistent focus on improving the quality of life for all Airmen, Guardians, and Family members is directly linked to stronger families, united forces, and the mission effectiveness of our Air and Space Forces," said Kari Voliva, AFA's Vice President for Member & Field Relations. "We're proud to launch this event as part of that consistent focus and will continue to find ways to promote the power of meaningful connections."

The event kicked off with a live podcast with Jennifer Ferrell and Kirstin Navaroli of "Wives of the Armed Forces," a community of thousands of military spouses, where the conversations highlighted the realities of military family life through various seasons and unique challenges. The discussion provided a rare and intimate look into the resilience, sacrifices, and triumphs that often define the military spouse experience.

The summit also welcomed Dr. Jason Womack, a renowned Space Force leadership strategist, author, and keynote speaker. He spoke on building momentum and thriving in all seasons of military life. He underscored the importance of personal growth, adaptability, and cultivating strong support networks to sustain well-being and success in family and career.

Another highlight was a conversation with Savannah Stephens, a dual-military spouse, whose personal story of service and community-building is featured in the latest edition of ENGAGE, AFA's digital publication. Her journey exemplifies the resilience, adaptability, and unwavering support that military spouses provide, not just to their families, but to the broader defense community.

"It was so refreshing to be surrounded by other military spouses who truly understand the unique aspects of our lives," said Brooke Wright, a Space Force spouse who attended the event. "We all left feeling more connected and motivated to continue building a supportive community—taking care of our military families will always positively impact force readiness."

Central to the event was the unveiling of the fourth edition of ENGAGE, a digital publication produced entirely by a team of military spouses contracted through the F2 Program. This latest edition offers interviews with Sam Eckholm (a former Air Force officer with more than 1 million subscribers on YouTube), Christina Mattinson (a leadership coach and retreat organizer for military spouses and veterans), and influential voices from "Military City USA" (official nickname for San Antonio), showcasing perspectives on military service, innovative programs, and the essential role of strong community support. Through its own unique storytelling, "ENGAGE: United Through Community" continues to document the triumphs, challenges, and everyday experiences that define military life.

Spouses play a crucial role in sustaining military readiness, providing stability in times of uncertainty, and fostering strong, mission-ready communities. Through initiatives like this summit, AFA reaffirms its commitment to empowering military families, amplifying their voices, and equipping them with the resources needed to thrive.

To explore the stories shared at the summit and read the latest edition of ENGAGE, visit **www.afa.org/f2/engage/.**

By Col. Phillip S. Meilinger, USAF (Ret.)

Benjamin O. Davis Jr.

Career Airman who served proudly.

Our armed forces have not always been integrated. Although Blacks served, they did so in specialized units commanded by White officers and suffered institutional discrimination in the 1940s and beyond. Racial inequality was both pervasive and humiliating.

Benjamin O. Davis Jr. understood the problem. His father, Benjamin Davis Sr., was an Army officer who had entered service during the Spanish-American War, saw action in World War I, and was then posted to teaching positions at Black universities—the Army did not want him in command of White soldiers. He became a brigade commander of an all-Black cavalry unit in 1937, and in 1940 was promoted to brigadier general—the first Black general in American history.

Ben Davis Jr. was likewise attracted to the military, and after two years of college was appointed to West Point. He graduated in 1936, the first Black to graduate since 1889. His treatment while a cadet was poor. White Soldiers and cadets did not want Blacks at their Academy, and tried to drive Davis out. He was silenced: No one, not fellow cadets, not instructors, and not the staff, was permitted to talk to him, except in the line of duty, for his entire four years. He roomed alone; he ate alone; he studied alone. But Davis was stubborn and refused to break. He later stated that only the unending support of his girlfriend, Agatha Scott, who visited him most weekends, got him through the ordeal. It is telling that it was over 50 years before Davis returned to his alma mater. He had no fond memories.

Courtesy photo via U.S. Air Force Academy

A painting of Benjamin O. Davis in front of a P-47 Thunderbolt in 1944.

He and Agatha married after graduation and Davis applied for pilot training but was refused. There were no Blacks in the Air Corps. He was instead given infantry assignments in Black units where he did not interact with Whites. Rapid change occurred when war broke out in Europe and it was apparent the U.S. would soon get involved. In 1942 Davis finally became a pilot. When the 99th Fighter Squadron was formed with only Black pilots who had attended the Tuskegee Institute in Alabama, Lt. Col. Davis was named its commander.

Davis took his squadron to North Africa where its P-40s flew ground support and escort missions. Despite the unit's obvious abilities and statistical achievements, the Tuskegee Airmen were still not treated as equals. Its officers, contrary to Army regulations, were not allowed to use the Officers Club—Whites did not want them. After a tour in Washington, D.C., Davis returned to Europe as a group commander—again commanding the Red Tails. The mission of the group, now flying P-51s, was escort for the bombers of the Fifteenth Air Force. Their performance was outstanding and everyone soon realized it, and they finally earned a measure of acceptance and respect.

In 1948, President Harry Truman issued an executive order decreeing integration of the military. Davis attended Air War College, and he later wrote that this was the first time he had the chance "to associate with my White peers." He moved to the Pentagon as head of the Fighter Branch and in that position pushed for the fighter force to be air refuelable and for the establishment of an elite aerial demonstration team—the Thunderbirds.

He was a fighter wing commander in the Korean War, and received his first star in 1954 as chief of staff of Twelfth Air Force. He returned to the Pentagon where he pinned on a second star—the first Black officer to reach that rank in American military history.

During the Vietnam War, Davis was again sent overseas—his third war and now wearing his third star. As commander of the Thirteenth Air Force in the Philippines, he was responsible for a key unit flying daily combat missions in Southeast Asia. It was a job that also involved much diplomacy as he traveled throughout the theater meeting with allied military and civilian leaders. He returned from the war to become deputy commander of Strike Command.

Davis retired in 1970, but President Richard Nixon soon named him the director of civil aviation security for the Department of Transportation at a time when aerial hijackings were increasingly common. He moved quickly to counter this threat. He retired again but stayed active in various civic and veterans' groups.

In 1998, Congress approved his promotion to four-star general and President Bill Clinton pinned on his fourth star. Davis lost his beloved Agatha in 2002, and he followed her soon after.

Benjamin Davis Jr., was a true American hero who served his country through three wars, despite facing countless obstacles along the way. He never quit; he simply worked harder.

"Benjamin O. Davis Jr., American" is the title of the general's memoirs and they are insightful, honest, and sobering. A good biography is needed of this important American Airman.

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